Contract No. KYV-ICB-01-L1 “Reconstruction of Ist level pump stations of Dniprovskva water station, including installation of energy saving equipment and frequency regulation with water intake facilities”

Contract No. KYV-ICB-01-L2 “Reconstruction of IIIrd level water pump station of Desnianska water station, including installation of energy efficient equipment and frequency regulation in the city of Kyiv” “Reconstruction of the PS "Kruzhirna" with the replacement of electrical equipment in the city of Kyiv”

Contract No. KYV-ICB-02 “Modernization of booster pump stations, including installation of efficient pumping equipment with frequency regulation in the city of Kyiv”

Environmental and social management plan
Content

Introduction ........................................................................................................................................... 3
1. Legislative base, licenses and permissions ...................................................................................... 6
2. Characteristics of the existing water supply and sewage system ...................................................... 15
3. Existing social and environmental conditions .................................................................................... 16
4. Characteristics of the project activity ................................................................................................. 20
5. Characteristics of the impacts of the projected activities on the environment and the social sphere ......................................................................................................................................................................................... 26
6. Mitigation measures of negative impacts on the environment ............................................................ 36
7. Mechanism of implementation of external communications, disclosure of information and processing of appeals of the population ......................................................................................................................................................................................... 38
8. Occupational safety and health ........................................................................................................... 41
9. Control and monitoring measures ...................................................................................................... 54
10. Development of the institutional capacity and training .................................................................... 56
11. Environmental impacts of the proposed construction process ......................................................... 58
12. Mitigation measures planned to be implemented ............................................................................... 61
13. Monitoring plan .................................................................................................................................. 73
Annex 1. General information on the project and the site ..................................................................... 79
### LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESMP</td>
<td>Environmental and Social Management Plan</td>
</tr>
<tr>
<td>WWPS</td>
<td>Wastewater Pumping Station</td>
</tr>
<tr>
<td>WWTP</td>
<td>Wastewater Treatment Plant</td>
</tr>
<tr>
<td>DBN</td>
<td>State building standards</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>MPC</td>
<td>Maximum Permissible Concentrations</td>
</tr>
<tr>
<td>СН</td>
<td>Sanitary norms</td>
</tr>
<tr>
<td>ДСП</td>
<td>State sanitary regulations</td>
</tr>
<tr>
<td>SPZ</td>
<td>Sanitary protection zone</td>
</tr>
</tbody>
</table>
Introduction

The Environmental and social management plan was developed by the PrJSC “Kyivvodokanal” within the framework of the investment Second Urban Infrastructure Project, which is financed primarily by the International Bank for Reconstruction and Development (the World Bank) jointly with the Clean Technologies Fund. This plan includes the procedures and mechanisms to be used by the Project in order to comply with World Bank environmental and social safeguards policies, and the Ukrainian environmental legislation and regulations.

It should be noted that during the implementation of the investment project, PrJSC “Kyivvodokanal” plans to achieve the following objectives related to:
- Reconstruction of the I level water pump station of the Dnieper water supply station with the introduction of energy saving equipment and frequency regulation with water intake structures;
- Reconstruction of the IIIrd level water pump station at Desnianska pump station with the introduction of energy saving equipment and frequency regulation, reconstruction of the PS "Krutohirna" with the replacement of pump equipment in the city of Kyiv;
- Modernization of water pump stations with installation of energy-efficient pump equipment with frequency regulation.

According to the World Bank's Operational Policy 4.01 "Environmental assessment" (OP 4.01 Environmental Assessment), the sub-project of PrJSC “Kyivvodokanal” belongs to Category B projects, as the result of the planned activities, the potential negative consequences of the project implementation will be temporary and can be minimized or completely eliminated due to the development and implementation of a mitigation system.

The purpose of this sub-project is to improve the quality and efficiency of services in the Kyiv water supply sector by implementing a set of measures, increasing the energy efficiency of this economic sector of the city, enhancing the stability and reliability of the city water supply and drainage systems, improving water quality and the overall ecological situation in the region through better wastewater treatment and discharge quality parameters.

The Environmental and Social Management Plan (ESMP) analyzes the environmental and social issues associated with the proposed sub-projects in the field of water supply and sanitation, in accordance with the requirements of the World Bank to ensure all necessary measures are taken to minimize the potential impact of the Project on the environment and protection people.

The purpose of the Environmental and social management plan (ESMP) is to provide social guarantees and compliance of the planned activities with the current national environmental legislation of Ukraine and relevant World Bank Policies, and to meet the water supply and sewage sector quality and efficiency improvement requirements specified in the Project loan agreement.
ESMP implements a mechanism for ensuring environmental and social sustainability of the sub-project throughout its period of implementation and aims at achieving the following objectives:

- analysis, definition and implementation of a set of measures to mitigate the negative impact of factors of social and environmental nature;
- avoiding identified environmental and social impacts (where feasible), minimizing the implementation of measures to minimize the above-mentioned effects, or reducing the effects to an acceptable level;
- an analysis of the existing system of safety management at the enterprise and the introduction of a set of measures for its modernization in order to comply with the current national legislation and the relevant safeguards policies of the World Bank;
- definition of the institutional structure responsible for the implementation of the ESMP;
- stakeholder analysis of the project implementation and improvement of the mechanism of interaction with them;
- development of an effective monitoring system for the implementation of this sub-project.

The activities and work proposed in the framework of the SUIP will not have significant negative social or environmental consequences. In addition, the positive impact on the environment is expected through more efficient wastewater treatment, reduced energy consumption and water losses in pipelines. Nevertheless, in order to prevent social and environmental risks, careful monitoring and control of certain measures must be carried out.
1. Legislative base, licenses and permissions

The following hierarchical structure of legislative documents was adopted in Ukraine:
- Constitution;
- Codes;
- Laws;
- Decisions of the Cabinet of Ministers of Ukraine and Decrees of the President;
- Orders of the relevant ministries;
- Local regulations.

Given the scope of SUIP-2, namely:
- The implementation of sub-projects will not lead to an increase in water intake or increase in waste water discharged into water bodies;
- Construction of facilities on the territory of communal enterprises will be carried out within the city;
- The implementation of sub-projects will not promote the creation of new types of waste (compared to existing waste from existing buildings that will be upgraded), nor will it require additional permits for waste placement;
- There will be a potential positive impact on the environment by improving energy efficiency, improving sewage treatment, reducing water intake by reducing water volume due to reduced water losses.

The legislative and regulatory framework of Ukraine that regulates environmental issues is rather comprehensive and complex, and sometimes even controversial. It consists of international conventions, treaties, protocols and agreements ratified by the Verkhovna Rada of Ukraine, laws, regulations and orders of the Cabinet of Ministers of Ukraine, orders of ministries. Decisions of the Cabinet of Ministers and orders of ministries approve of various rules, rules of standards and instructions, collectively called "normative acts". Registration at the Ministry of Justice of Ukraine is a prerequisite for the entry into force of each legislative act.

As of today, the following regulatory documents apply to the field of water supply and drainage:
- Water Code of Ukraine (introduced by the Verkhovna Rada of Ukraine from 06.06.95 No. 214/9-5-VR);
- The Code of Ukraine "On Subsoil" (introduced by the Verkhovna Rada of Ukraine from 27.07.94 No. 133/94-VR);
- Law of Ukraine "On Environmental Protection" from 26.06.1991 No. 1264-XII
- Law of Ukraine "On the National Target Program "Drinking Water of Ukraine" for 2011-2020" from 03.03.2005 No. 2455-IV
- The Law of Ukraine "On Fisheries, Industrial Fisheries and Water Protection" from 08.07.2011 No. 3677-VI
- State sanitary rules for the protection of atmospheric air of populated areas (from contamination by chemical and biological substances) (DSP-201-97), (as amended in accordance with the order of the Ministry of Health No. 30 from 02.02.2000) approved by the order of the Ministry of Health of Ukraine No 201 from 09.07.97.
- State sanitary rules of planning and development of settlements, approved by the order of the Ministry of Health of Ukraine (DSP-173-96) No.173 from 19.06.96 and registered with the Ministry of Justice of Ukraine from 24.07.96 under No. 379/1404.
- Collection of "Maximum Permissible Concentrations (GDK) and Approximately Safe Levels of Action (OBRD) of pollutants in the atmospheric air of human settlements", developed by the Office of Atmospheric Air of the Ministry of Natural Resources of Ukraine, the Ukrainian Scientific Center for Technical Ecology, etc., approved by the Ministry of Health of Ukraine on 29.12.2000, No. 497.
- Approximately safe levels of exposure (OBRV) of pollutants in the atmospheric air of populated areas. Hygienic norm. GN2.2.6-125-2013.
- Resolution of the Chief State Sanitary Doctor of Ukraine No. 18 from 01.06.2010 "On approval of the value of the hygienic standard for a chemical substance in the atmospheric air of populated areas".
- Hygienic requirements for the management of industrial waste and the definition of their class of danger to the health of the population. State sanitary rules and norms of State sanitary norms and rules (DSanPiN) 2.2.7.029-99. Ministry of Health of Ukraine. The main sanitary and epidemiological control.
- DK005-96 Classifier of waste.

Program documentation:
In 2010, the Verkhovna Rada of Ukraine adopted the Law "On the basic principles (Strategy) of the State Environmental Policy of Ukraine for the Period until 2020" from 21.12.20102818-UI, which defined the purpose of environmental policy for the current period. Several provisions of this policy relate to drinking water: "Improving the environmental situation and raising the level of environmental safety: "Reconstruction of existing and construction of new urban treatment facilities to reduce the level of pollution of water by pollutants (primarily organic substances, nitrogen and phosphorus compounds) by 15% by 2020, as well as reducing the discharge of insufficiently treated sewage by 20% (before the base year ) by 2020."

In 2011, the Verkhovna Rada of Ukraine adopted the Law No. 2455-IU from 03.03.2005 "On amendments to the law of Ukraine "On the National program "Drinking water of Ukraine" for 2006-2020". In fact, this law approved the National program "Drinking water of Ukraine" for 2011 - 2020. The program provides, among other things, for solving the following problems in the field of water supply and sanitation:
- bringing the sanitary protection zones and water protection zones of drinking water supply sources in line with the normative requirements; carrying out an assessment of the ecological and hygienic status of sources of drinking water supply for compliance with the established requirements;
- inventory of sewage treatment facilities;
- construction and reconstruction of water supply and sewage treatment facilities in order to reduce the volume of untreated sewage discharged into water bodies, as well as the burial OR recycling of sediments;
- equipping of water and sewage quality control laboratories with the modern monitoring and analytical equipment;
- bringing the regulatory framework in the field of drinking water supply and drainage in line with the standards of the European Union taking into account national peculiarities, including in terms of increasing liability for violations of environmental pollution standards, primarily discharges of industrial waste water into water facilities;
- integrated research and development to improve the energy and resource management, enhance the quality of drinking water and sewage treatment, as well as implementation of such developments.

Legislation on water protection
At the legislative level, the issues of water resources management in the territory of Ukraine are regulated by the Water Code No. 213/95-VR dated 06.06.1995 (as amended) and other by-laws that are intended to preserve, ensure rational and scientifically substantiated use and reproduction of water resources; protect water from pollution, contamination and exhaustion; prevent and mitigate negative impacts on water resources; improve the ecological condition of water environment and protect water users’ rights.

The main requirements for the water supply and water discharge sector (WS/WD) are to obtain a permit for water withdrawal from a water source (special water use permit) and permit for the discharge of treated or untreated sewage water into the environment. Recently, these critically important aspects of the legislation have undergone significant changes related to the reorganization of the Ministry of Ecology and Natural Resources of Ukraine (Ministry of Environmental Protection): new regulations of the Ministry were approved by the Presidential Decree from 13.04.2011 and adopted by the Cabinet of Ministers on 11.09.2013. One of the important innovations is that since May 18, 2013, the permits for special water use are issued not by the Ministry of Environmental Protection, but by the Cabinet of Ministers of the Autonomous Republic of Crimea and regional administrations (for water sources of national importance), as well as by the Committee of the Autonomous Republic of Crimea for the protection of the environment and regional councils (for water sources of local importance). However, the procedure for issuing such permits remained unchanged.

The main existing norms and standards in the management and the use of water resources are:
- CMU Resolution "On approval of the procedure for agreement and issuing permits for special water use" (as amended) from 13.03.2002 No. 321;
- "On the procedure for the development and approval of standards for the maximum permissible discharge of pollutants and the list of pollutants the discharge of which to be standardized" (as amended) from 11.09.1996 No. 1100;
- State sanitary rules and norms "Drinking water. Hygienic requirements for the quality of centralized water supply and drinking water supply "(as amended), approved by the Order of the Ministry of Health of Ukraine from December 23, 1996 No. 383;
- Order of the State Committee for Construction, Architecture and Housing Policy of Ukraine No. 69 from 03.04.98 "On approval of statutory acts: "Rules of inspections, assessment of the technical condition and certification of external networks and structures of water supply and sewerage" and "Regulations on safe and reliable operation of external networks and structures of water supply and sanitation";
- Order of the Ministry of Environmental Protection and Nuclear Safety of Ukraine No. 116 from 15.12.1994 "Instruction on the procedure for the development and establishment of the maximum permissible level of pollutants in wastewater discharged into surface water";
- Order of the Ministry of Health of Ukraine No. 173 from 19.06.96 "On the rules for the establishment and use of sanitary protection zones of drinking water sources" (as amended).

**Protection of atmospheric air**

Legislative aspects on air protection are important for the proposed sub-projects, as some of them provide for the reconstruction of the water chlorination system and some may lead to additional pollution of atmospheric air.

Legal and institutional frameworks along with the basic requirements in the field of protection of atmospheric air is defined in the Law of Ukraine No. 2707-XII from 16.10.1992 "On the Protection of Atmospheric Air" (as amended). This Law is aimed at preserving and restoring the natural state of the air, creating favourable conditions for life, providing environmental safety and preventing the harmful effects of atmospheric air on human health and the environment.

The main regulatory acts and standards in the field of air protection include:
- Resolution of the Cabinet of Ministers of Ukraine No. 300 from 13.03.2002, which approves the "Procedure for determining the influence of physical and biological factors on the state of atmospheric air";
- Resolution of the Cabinet of Ministers of Ukraine No. 1780 from 28.12.2001, which approves the "Procedure for determining the standards for permissible emission of pollutants into atmospheric air from stationary sources";
- Resolution of the Cabinet of Ministers of Ukraine No. 343 from 9.03.1999, which approves the "Procedure for the implementation of state monitoring in the field of atmospheric air protection";
- Instructions on inventory of emissions and sources of pollutant emissions into the air, approved by the order of the Ministry of Environmental Protection and Nuclear Safety of Ukraine on 10.02.1995. No. 7;
- Maximum permissible concentrations (GDK) and approximate safe levels of action (OBRD) of pollutants in the atmospheric air of populated areas.

**Sanitary Welfare**

The Law of Ukraine "On ensuring the sanitary and epidemiological well-being of the population" (as amended) No. 4004-XII from 24.02.1994 and the normative acts based on this law are of primary importance for the water supply and sewage sector. The State Sanitary and Epidemiological Service (DSEC) under the Ministry of Health of Ukraine carries out its activities on the basis of this law and relevant regulations.

**Assessment of the environmental impact**

The legal and organizational principles of environmental impact assessment, aimed at preventing environmental damage, ensuring environmental safety, environmental protection,
rational use and reproduction of natural resources, in the process of making decisions on the conduct of economic activity, which may have a significant impact on the environment, taking into account state, public and private interests are defined in the Law of Ukraine "On environmental impact assessment" No. 2059-19 dated 23.05.2017. Taking into account that the reconstruction of the Dniprovska pump station provides:

- dismantling of existing foundations for equipment;
- removal of part of existing metal stairs and platforms;
- arrangement of new foundations for equipment;
- arrangement of racks for unloading of pipelines and shut-off valves;
- arrangement of metal stairs and service areas; arrangement of metal fences of new metal stairs and platforms;
- replacement of existing pump units No. 1, No. 5 for new energy-efficient pump units with productivity \( Q = 3000 \text{ m}^3/\text{h} \), pressure \( H = 43 \text{ m} \) and operating voltage of 10 kV;
- replacement of shut-off valves and check valves at pressure collectors of designed pump units;
- arrangement of a high-voltage frequency converter (HPV) of a container type for automatic regulation of water supply by changing the rotation frequency of the engine of the pump unit;
- replacement of existing 10 kV cells with oil switches to new 10 kV cells with vacuum switches;
- arrangement of new equipment RP-0,4 kV, existing equipment is subject to dismantling;
- arrangement of new power lines with voltage of 10 kV, existing lines are subject to dismantling;
- lighting system of premises of RP-0,4 kV and operator's on the basis of LED light sources;
- arrangement of the grounding system of the projected equipment;

In accordance with the Criteria for determining the extensions and changes in activities and objects that are not subject to environmental impact assessment, approved by the CMU Decree No. 1010 from 13.12.2017, the planned activities do not require an environmental impact assessment.

Engineering and survey works, design and construction are regulated by the Minregion.

There are a number of norms and standards in the field of design and construction, including state building regulations for environmental impact assessment (short OVNS, DBN A.2.2-1-2003). The Law "On Environmental Expertise" does not state that an organization that proposes a project for implementation should submit EIA documentation to the state environmental assessment section or the volume of the feasibility study, but this issue is reflected in the relevant regulatory acts.

The main law regulating all types of construction activity is the Law of Ukraine "On Regulation of Urban Development" from 12.03.2011. This law defines the list of documents
that must be prepared for the various types of construction projects, as well as the procedure for reviewing this documentation. Full-scale EIA (with materials for public consultations, as required by DBN A.2.2-1-2003) is only required for projects of high environmental hazard (Article 31 of the Law "On Regulation of Urban Development" (as amended) dated February 17, 2011 No. 3038-II). In order to determine whether an object can be considered as such, the design engineer from the design organization should use the criteria specified by the Law of Ukraine "On hazardous objects" (as amended) No. 2245-III from 18.01.2001 and the CMU Resolution "On identification and declaration of safety of objects of high danger "(as amended) No. 956 from 11.07.2002. The object owner is responsible for defining the object, and the definition depends on the number of dangerous substances (e.g., chlorine). In addition, there is also a resolution of the Cabinet of Ministers of Ukraine from 28.08.2013 "On approval of the list of activities and objects constituting enhanced environmental danger" No. 808 from 28.08.2013, which was published in the official bulletin of 19.11.2013. This list specifies (p. 15) WS/WD constructions, as well as "New construction, reconstruction, restoration and overhaul" of WS/WD structures. This means that the planned sub-projects fall under the category of "high ecological danger". Part 2 of Article 31 of the Law of Ukraine "On regulation of urban development" requires the examination of the project documentation by a licensed expert organization in accordance with the rules specified by the Resolution of the Cabinet of Ministers of Ukraine (CMU) No. 560 from 11.05.2011. This resolution requires the mandatory examination, which includes environmental and sanitary-epidemiological components, for projects IV and V category of complexity. The rules for classifying projects (which projects are to be categorized as IV or V) are determined by the Resolution of CMU No. 557 from 27.04.2011. This classification does not apply to the above-mentioned objects of "increased danger", but takes into account the number of people who can permanently stay on the site (more than 300) or the number of people outside the facility (over 10,000), which may be there at the moment of the accident. The organization proposing the project for implementation is responsible for defining the categories covered by the project.

If projects of IV and V category of complications are financed from the state budget, or at the expense of state and municipal enterprises and organizations, or at the expense of loans obtained under state guarantees, the project expertise should be conducted by a state expert organization. There is a special resolution of the CMU No 16 from 14.01.2009 "On Approval of the criteria for assessing the degree of risk from conducting business activities in the field of drinking water supply and drainage and determining the frequency of implementation of planned state supervision (control)", which defines the criteria for the risks associated with the execution of works in the water supply sector and drainage, including environmental risks. According to this resolution, such objects as "supply of drinking water, including water intakes, pump stations, water pipelines, tanks and pressure towers, wastewater collection and treatment, including sewage pipelines, collectors, pump stations, sewage treatment facilities" may be included to a category of potentially dangerous or of those of increased danger.

In accordance with the requirements of the Aarhus Convention (Denmark, 1998), ratified in the territory of Ukraine, the Laws of Ukraine No. 2657-XII "On information" from 02.10.1992, No. 1264-XII "On environmental protection" from 25.06.1991, No. 2059-19 "On the environmental impact assessment" from 23.05.2017, Resolution of CMU No. 302 from 13.03.2002 and the Order of the Ministry of Environmental Protection No. 168 "On approval
of the regulation on public participation in decision-making in the field of environmental protection" from 18.12.2003, as well as in accordance with the requirements of DBN A.2.2-1-2003 "Statement of Intent" and "From Java on the environmental consequences" published in the local mass media". During the 30 days since the publication of the Statement of Intent, no suggestions and comments were received from the local community, the negative reaction of the population living in the area of the projected object was also not found.

**World Bank policies**
Taking into account the scope of the planned subprojects, 3 out of 10 World Bank operational policies (OP / BP 4.01: Environmental Assessment, OP / BP, OP / BP 4.11: Material and Cultural Heritage, OP / BP 4.12: Involuntary resettlement) apply to UIP-2. These three policies are described below.

**OP 4.01: Environmental assessment**
This policy is applicable in the event if there is a probability of the potential (negative) environmental risks and impacts in the area of implementation of subprojects. OP/BP 4.01 covers environmental impacts (air, water, waste and soils); health and safety of the person; material cultural heritage; transboundary and global environmental issues.

As noted earlier, UIP-2 subprojects are classified as Category B projects. The Borrower is responsible for the environmental assessment of the project and the development of the Environmental and Social Management Plans (ESMP). For Category B environmental impacts, the Borrower conducts consultations with the affected project groups as well as local non-governmental organizations (NGOs) on the environmental impact of the project and takes into account their point of view. The Borrower should initiate such consultations as soon as possible. The Borrower should place ESMF and detailed ESMPs on a public resource and provide access to these documents to anyone willing to conduct public consultations and in a language that is understandable for the groups consulted. These documents should be available in the country and at local levels where subprojects are implemented, in the national language and in public cities accessible to groups and non-governmental organizations, prior to the examination of the project.

**OP 4.11: Material cultural heritage**
During the implementation of UIP-2, there is a probability of using the World Bank's OP 4.11 "Material and Cultural Heritage". In the event that the implementation of a subproject can potentially impact on material cultural resources, the borrower / beneficiary of the subproject, together with the SPMU, will have to prepare a Plan of Action for the Protection of Cultural Heritage (PAPC) and agree it with the local authority responsible for cultural heritage. This plan must comply with the provisions of the Law of Ukraine "On the Protection of the Cultural Heritage" dated 08.06.2000 №1805-III. The PAPC should be part of the Environmental and Social Management Plan for subprojects where declared buildings and / or other historical and cultural facilities that could potentially be damaged during the implementation of the subproject.
This question should be reflected in the work contracts. Utilities must ensure that the relevant requirements are included in the sub-borrower's contract, where it assumes the responsibility
to implement appropriate mitigation, monitoring and reporting measures as specified in the ESMP, if this occurs.

**OP 4.12: Involuntary resettlement**

This policy covers not only physical displacement, but also any loss of land or property, which leads to:
- displacement or loss of housing;
- loss of property or access to property;
- loss of a source of income or livelihoods regardless of whether the persons who are negatively affected by the project move to another place or not.

This policy also applies to the involuntary restriction of access to designated officially protected parks and protected areas as a result of the negative impact on the livelihoods of displaced persons.

Resettlement planning is an integral part of the preparation of projects supported by the Bank. At the project identification stage, the Working Group defines all activities related to potential involuntary relocations within the project.

The condition for the implementation of projects involving involuntary resettlement is to provide the Bank with the Borrower's resettlement plan, a framework document identifying a resettlement policy or a framework process that meets the requirements of OP 4.12. The draft document covers issues related to resettlement, proposes measures and measures for resettlement, as well as the Borrower's relocation obligations and institutional and financial capacity for resettlement.

**The World Bank Group Environmental Health and Safety Guidelines**

The environmental, health, and safety (EHS) guidelines are technical reference documents with general and industry-specific examples of good international industry practice (GIIP). When one or more members of the World Bank Group are involved in a project, these EHS guidelines are applied as required by their respective policies and standards. The EHS guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs. Application of the EHS guidelines to existing facilities may involve the establishment of site-specific targets, with an appropriate timetable for achieving them. When host country regulations differ from the levels and measures presented in the EHS guidelines, projects are expected to achieve whichever is more stringent. If less stringent levels or measures than those provided in these EHS guidelines are appropriate, in view of specific project circumstances, a full and detailed justification for any presented alternatives is needed as part of the site-specific environmental assessment.

**Permits for activities of enterprises of the water supply sector and drainage**

The current system of issuing environmental permits in Ukraine is based on separate regulatory documents for the protection of atmospheric air, water protection and waste management. A valid permit is required for all sources of atmospheric air and water pollution, which determines the maximum permissible values of emissions into the air and discharges into water bodies, as well as establishes requirements for monitoring.

There are separate permits that determine the rules for waste storage and disposal.
In order to resolve these issues in 2011, the Verkhovna Rada of Ukraine adopted the Law "On the List of Permission Documents in the Sphere of Economic Activity" dated 19.05.2011 №3392-VI. Under this law, economic entities must possess only those permits listed in the Appendix to the law.

PrJSC “Kyivvodokanal” has all the necessary permissions and licenses for the conduct of its activities, namely:

- Permit No. 522.17.32 from 23.12.2017 to 22.12.22 on the operation of vessels under pressure of more than 0.05 MPa.
- Permit No. 521.17.32 from 23.12.2017 to 22.12.22 for operation of lifting cranes and cars.
- Permit No. 3615.16.32 from 20.12.2016 to 19.12.21 for the operation of pressure vessels with a pressure of more than 0.05 MPa.
- License No. 2272.17.32 from 15.08.2017 to 14.08.22 for installation, disassembly, adjustment, repair, maintenance of machines, mechanisms of equipment of increased danger.
- Permit No. 2688.17.32 from 28.09.2017 to 27.09.22 for the operation of vessels under pressure of more than 0.05 MPa.
- Permission No. 3030.17.32 from 31.11.2017 to 31.10.22 on the operation of pressure vessels with a pressure of more than 0.05 MPa.
- Permission No. 3073.17.32 from 03.11.2017 to 02.11.22 on the operation of pressure vessels with a pressure of more than 0.05 MPa.
- License No. 3812.16.32 from 29.12.2016 to 28.12.21 for the operation of lifting cranes and machines.
- License No. 3813.16.32 from 29.12.2016 to 28.12.21 for the operation of lifting cranes and machines.
2. Characteristics of the existing water supply and sewage system

The sources of drinking water supply for the city of Kyiv are the Dnieper River, Desna and artesian wells. The city water supply system consists of two pump treatment stations (Desnianska pump station and Dniprovska pump station), 42 pump stations, 343 artesian wells and 4,200 km of water supply networks. The average consumption of drinking water by the inhabitants of Kyiv is 700 thousand cubic meters per day.

Implementation of the projects "Reconstruction of the Desnianska IIIrd water pump station with the introduction of energy saving equipment and frequency regulation in the city of Kyiv" and "Reconstruction of the energy sector of the National Assembly "Krutohirna" with the replacement of electrical equipment in the city of Kyiv" will allow more even water supply through the use of frequency regulation and will lead to a reduction in energy consumption.
3. Existing social and environmental conditions

Kyiv is the capital of Ukraine, one of the largest and oldest cities in Europe, located in the middle reaches of the Dnieper, in the northern Dnieper Ukraine. Political, socio-economic, transport and educational-scientific center of the country. A separate administrative-territorial unit in Ukraine and an administrative center of the Kyiv region. District center of Kyiv-Svyatoshinsky district. Administratively it is not part of the Kyiv region. The location of the central authorities of Ukraine, foreign missions, headquarters of most enterprises and public associations working in Ukraine.

The city of Kyiv is 847.66 thousand hectares. Height above sea level - 179 m. As of 01.02.2018 the official population of the city of Kyiv amounted to 2,934,401 people.

Physical-geographical characteristics of the area of work. The city of Kyiv is located in the north of Ukraine in the middle reaches of the Dnieper, on the border of the forest and forest-steppe physical and geographical zones. The Dnieper river divides the city in half. The northern part of the Kyiv right bank lies in the Polesia lowlands, the south of the right bank - at the Dnieper highlands, and represents an elevated plateau-like plain disassembled by ravines, gullies and valleys of small rivers. Relative heights are 100-150 m. Characteristic features of the relief of the Right Bank are the remnants of the mountains (Starokievskaya, Shchekavitsa, Khorevitsa, Lisa, Chorna, Batieva) and ravine (Babin, Protasov, Kmytiv, Smorodinsky, etc.). The left-bank part of the city lies on the Dnieper Lowland. It is a terraced, weakly divided plain with relative heights of up to 35 m.

The object of reconstruction is located in the southwest (right-bank) part of the city. of Kyiv. Geographically, the reconstruction object is located in the super-floodplain terraces of the river Dnieper within the limits of the city of Kyiv, on the Dnieper Highland (Kyiv Plateau), which is an elevated plateau-shaped forest plain disassembled by ravines and gullies, valleys of small rivers. Absolute markings of the surface of the land within the site is 180-166 m.

Climatic characteristics of the area of work. The object of the planned activity according to DSTU-N B V.1.1-27: 2010 "Construction climatology" is located in the I climate zone. The climate is temperate-continental with a short temperate-mild winter (average temperature in January is -5.9 °C) and warm, long summer (average July temperature is + 19.2 °C). The maximum monthly precipitation is 642 mm., the average rainfall is 359 mm, and the cold is 180 mm. Total evaporation from the surface of the earth is 540 mm. The stable snow cover is observed from 2 November to 9 February, the height of the snow cover varies from 5 to 70 cm (average - 30 cm). Number of days with snow cover 95 - 110. Depth of freezing of soil from 24 to 140 cm.

The object of construction is characterized by the following climatic conditions:
- depth of freezing of soil - 1.2 m;
- Typical snow load - 175.4 kgf/m²;
- Typical wind load - 41.8 kgf / m²;
The average annual air temperature is +8 °C, the lowest in January (minus 4.7 °C), the highest in July (19.8 °C). The coldest day is the "minus" 40 °C, the hottest day is "plus" 40 °C. The duration of the heating period, at an average temperature of 0.1 °C, is 176 days.

**Fig. 3.1. Indicators average monthly temperatures in the city of Kyiv, °C**

![Graph showing average monthly temperatures in Kyiv](image)

Dominant winds: in the cold period, southern, south-eastern, in the warm period - south-west, west. Maximum possible wind speeds are 17 m/s annually, 20-21 m/s once every 5-10 years, 22-23 m/s once every 15-20 years.

**Fig. 3.2. The annual wind rose of the city of Kyiv**

![Wind rose graph](image)

**Precipitation.**
On average, 642 mm of precipitation fall over the year, less than in March and October, most of all in June and July. Every year a snow cover is formed, the highest height of which is observed in February. Relative humidity of air in the middle of the year is 74%, the smallest in May (67%), the highest in December (85%). The number of days with thunderstorms on average per year is 14, hail-3, snow-64.
Geologically, the city of Kyiv with its adjoining territories is located in the zone of the interface between two regional structures of the north-eastern slope of the Ukrainian shield and the southwestern side of the Dnieper-Donets lowland. The boundary between them is the Dnieper zone of faults in the northwest direction, which makes Kyiv in a relatively calm tectonic zone. The territory of the Kyiv region tectonically refers to the aseismic zone with deposits of brick-tiled raw materials, construction sand, building stone, peat, fresh and mineral underground waters.

Kyiv is one of the largest business, financial, commercial and industrial centers in Europe, which coordinates the country's economy. Here are: The Government, the National Bank of Ukraine, the central offices of most corporations, foundations and institutions operating in Ukraine and abroad. Although 6% of the population of Ukraine live in Kyiv, % of Ukraine's GDP in 2017 is concentrated here.

Kyiv's economy is Ukraine's largest economy among administrative subjects in terms of the volume of the gross regional product - 22.9% in 2017, making it one of the largest financial centres in Europe. The city is the main centre of the banking sector, insurance and notarial services, mass media, journalism and publishing business in Ukraine, as well as the largest center of the arts. Creative industries such as new TV projects, advertising, fashion, design and architecture take a significant part in the city's economy.

Kyiv is one of the leading industrial centers of Ukraine. There are 763 industrial enterprises of different forms of ownership in the city. In addition, several thousand small industrial enterprises operate there. Kyiv's industry is a complex diversified production complex, which contains enterprises of almost all industries.

The main areas of industry are:
- Food industry, in particular the manufacture of food products, beverages and tobacco products;
- Light industry, including textile production, clothing, leather, leather goods and other materials;
- Engineering
- Metallurgy
- Aircraft
- Polygraphic industry;
- Chemical Industry;
- Pharmaceutical industry;
Kyiv is one of the largest research centers in Europe. Here is the National Academy of Sciences of Ukraine and most of its branch institutes, many of which have world-renowned scientific schools. Including: electric welding, powder metallurgy, cybernetics, synthesis of composite materials, laser technologies; various branch and departmental research and design institutes and organizations, as well as leading higher educational institutions of Ukraine. In total in the city of Kyiv there are 314 organizations engaged in scientific activity, which is almost a quarter of the total number in Ukraine.

There are 69 higher educational institutions and almost 350 scientific institutions in Kyiv, in which there are 1.5 thousand academicians and correspondent members, 6 thousand doctors of sciences, 24.5 thousand candidates of sciences, and more than 120 thousand pedagogical workers. The educational system largely determines the socio-economic, cultural and spiritual development of the Ukrainian capital.
4. Characteristics of the project activity

4.1. Reconstruction of Ist level pump stations of Dniprovska water station, including installation of energy saving equipment and frequency regulation with water intake facilities.

Pumping station No.2 of the first level was commissioned in 1981. There are four pumpsets. Characteristics 1000B4/63 A:
- Capacity Q = 13 750 cubic meters per hour acc. passport
- Height H = 63 m;
- Synchronous electrical motor СДВ 17 – 59 – 12;
- U = 6000 V; n = 500 rpm; I_{сг} = 353 A; N = 3200 kW.

Preliminary non-treated water from Dniepro River together with chlorine and ammonia water supplied to suction line is a working medium of pumping station. Intake basin is split into two compartments isolated by concrete wall. Pumpset No.1 and No.2 supply water from left compartment and pumpsets No.3 and No. 4 from right compartment.

Actual hydraulic load of Ist level pumping station is estimated in 7,0 - 13,0 thousand cub. m. per hour. Now, the required water supply is secured by operating of one of four pumpsets, simultaneous operation of one of abovementioned pumpsets with supplementary activation of lower capacity pumpsets or simultaneous operation of two, three of four pumpsets in compliance with daily stepping supply schedule. In specific cases the water supply control is performed by shutting of valve for one pumpset. Control of modes executed in discrete mode several time per day.

New pumpsets shall be installed at place of dismantled units. Foundation of pumpsets shall be reconstructed.

General finishing of pumpsets shall be done.
All required construction and installation works in machine hall shall be performed during power equipment operation.

Main ducts up to switchgear and location of new shall be constructed.
New utilities (new input cables, new ducts for future process equipment cables) shall be constructed.

_Pumping station reconstruction envisages:_
- replacement of two (2) pump sets 1of 3.2 MVA capacity to efficient pump sets without rotation control, but with soft starters;
- new installation of four supplementary pumpsets equipped with frequency control for simultaneous operation with installed pump sets;
- installation of new stop valves at pump set suction and delivery lines with relative piping;
- installation of two electrical drives of 7 000 cubic meters per hour pump sets without rotation control at 0,00 level of PS machine hall (equipped) with transmission shafts
(plate sleeves and intermediate bearing nodes) coupled with pumps;
- reconstruction of electrical equipment of switchgear with installation of frequency converters and water and power metering;
- replacement of two oil transformers to two dry transformers;
- installation of local and remote (control supervisory room) control equipment for PS equipment operation control;
- dismantlement of 1st level PS No1 and other equipment as mentioned in existing design;
- repair works of internal premises.

4.2. Reconstruction of IIIrd level water pump station of Desnianska water station, including installation of energy efficient equipment and frequency regulation and reconstruction of power utilities of "Kruzhirna" pump station, including replacement of pumping equipment.

The IIIrd water pump station III was put into operation in 1961.
The object of reconstruction is located in the southwestern (right-bank) part of the city of Kyiv at a distance of 0.8 km from the river Dnieper, 15 km north-east from the city of Brovary, within a radius of 20-28 km to the north, east, west, south are respectively the city of Boryspil, the city of Obukhiv, the city of Vasylkiv, the city of Boyarka, the city of Vishneve, the city of Irpin, the city of Vyshgorod.

Geographically, the reconstruction object is located in the super-floodplain terraces of the river Dnieper within the limits of the city of Kyiv, on the Pridneprovskoye hill (Kyiv Plateau), which is a raised plateau-like plain, dissected by ravines and gullies, valleys of small rivers. Absolute markings of the surface of the land within the site is 180-166 m.

In administrative terms, the land plot of the reconstruction object is located on the territory of the Pechersk district of the city of Kyiv, on the lands of the Kiyv City Council and is permanently used by PrJSC “Kiyvvodokanal”. Reconstruction works will not require any additional land acquisition and will be performed without current footprint of the water station.

The station is intended for pump drinking water for the needs of the central part of the city and provides water to about 276,000 consumers. The actual capacity of the station is 56,700 thousand m3/year (155.3 thousand m3/day). Category of reliability of water supply - I. The premises of the pump station have a category "D" for explosion and fire safety in accordance with NAPB B.03.002-2007.

Pump station on the design is partially deepened (semi-submerged). Six horizontal console centrifugal pumps are fitted with a sufficient suction height, relative to the level in the reservoirs of clean water. Usually there are two pump units in the daytime, and only one at night.

By the nature of management, it is the station with semi-automatic control.

Adjustment of water supply by step-by-step connection of pumps and additional throttling.
Pressure pipelines from the station - 2 pcs.

The valves used at the station allow the removal of any pump into the reserve for repair work without reducing the calculation of the pump station.

For the drainage of the engine room there is a self-propelled sewer system.

- The heating and ventilation systems of the pump station are in a state of operation and provide indicators, determined by sanitary norms. The project assumes: dismantling of existing foundations for equipment;
- removal of part of existing metal stairs and platforms;
- arrangement of new foundations for equipment; arrangement of racks for unloading of pipelines and shut-off valves;
- arrangement of metal stairs and service areas; arrangement of metal fences of new metal stairs and platforms;
- Replacement of existing pump units No. 1, No. 5 for new energy-efficient pump units with productivity \( Q = 3,000 \text{ m}^3/\text{h} \), pressure \( H = 43 \text{ m} \) and operating voltage of 10 kV;
- replacement of shut-off valves and check valves at pressure collectors of designed pump units;
- Arrangement of a high-voltage frequency converter (HPV) of a container type for automatic regulation of water supply by changing the rotation frequency of the engine of the pump unit;
- replacement of existing 10 kV cells with oil switches to new 10 kV cells with vacuum switches;
- arrangement of new equipment RP-0,4 kV, existing equipment is subject to dismantling;
- arrangement of new power lines with voltage of 10 kV, existing lines are subject to dismantling;
- lighting system of premises of RP-0,4 kV and operator-based light-emitting diode light sources;
- arrangement of the grounding system of the projected equipment;

The reconstruction of the facility does not involve changes in the technological processes of pumping and supplying drinking water to consumers. The maintenance of projected equipment is assumed by the current number of employees. Alternative variants of the planned activity were not considered, since the proposed design solutions are optimally feasible for the Customer and provide for the use of modern energy-efficient equipment.

4.3. Modernization of booster pump stations, including installation of efficient pumping equipment with frequency regulation in the city of Kyiv

Implementation of sub-project envisages:
- replacing of outdated pumping equipment at 20 booster stations with new pumpsets and install motor frequency converters to automatically control preset output parameters of the pumping station.
- replacing of suction and deliver pipelines within booster stations’ premises using steel pipelines and replace corresponding shut-off valves.
- replacing of shut-off and control valves with external and internal corrosion-resistant epoxy coating with tightness class A (acc. ГОСТ 9544) $P_3 = 10$ atm, quipped with water proofed actuator with remote control.
- arranging of metering nodes on their base of modern water meters and electricity supply meters with impulse outputs.
- arranging of supply and exhaust system of ventilation with natural instinct.
- arranging of fixed drain pump with automatic control.
- arranging of electrical heating system of booster station machine hall with fabricated equipment to maintain the temperature not less than 5° C.
- replacing of supply cables from frequency converters to pumping equipment.
- replacing of electrical wiring and lighting equipment using the energy savig lamps.
- Completion of civil works of internal and external surface of the booster station building using modern high technological waterproof materials.

Table 4.1. Existing pumpsets of BPS

<table>
<thead>
<tr>
<th>№</th>
<th>Location (address)</th>
<th>Pumpset type, q-ty</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Glushkova ave, 40</td>
<td>К100-80-160 – 2 pcs. Д320-50 – 2 pcs.</td>
<td>$Q = 60$ cub.m / hr $H = 38$ m $N = 11$ kW $Q = 320$ cub.m / hr$H = 50$ m $N = 30$ kW</td>
</tr>
<tr>
<td>2</td>
<td>Kablukova st., 9</td>
<td>5НДВ – 1 pcs.</td>
<td>$Q = 180$ cub.m / hr$H = 30$ m $N = 55$ kW</td>
</tr>
<tr>
<td>3</td>
<td>Bahmachska st. 10</td>
<td>КМ 100-65-200 – 2 pcs. КМ 80-50-200 – 1 pcs. КМ 80-65-160 – 1 pcs.</td>
<td>$Q = 61$ cub.m / hr$H = 49$ m $N = 30$ kW $Q = 50$ cub.m / hr$H = 50$ m $N = 15$ kW $Q = 45$ cub.m / hr$H = 30$ m $N = 15$ kW</td>
</tr>
<tr>
<td>4</td>
<td>Boulevard Lepse, 23</td>
<td>К 100-80-160 – 1 pcs. К 80-50-200 – 1 pcs.</td>
<td>$Q = 27$ cub.m / hr$H = 46$ m $N = 13$ kW $Q = 61$ cub.m / hr$H = 32$ m $N = 10,5$ kW</td>
</tr>
<tr>
<td>5</td>
<td>Kotelnikova st., 31-37</td>
<td>L.F.P. Leszvo ZHWR50,70,4 – 4 pcs.</td>
<td>$Q = 24$ cub.m / hr$H = 60$ m $N = 7,5$ kW</td>
</tr>
<tr>
<td>6</td>
<td>H. Stalingrada ave., 12D</td>
<td>К80-50-200 – 4 pcs.</td>
<td>$Q = 50$ cub.m / hr$H = 50$ m $N = 15$ kW</td>
</tr>
<tr>
<td>7</td>
<td>Povitroflotsky ave 34</td>
<td>3К9 – 2 pcs.</td>
<td>$Q = 30$ cub.m / hr$H = 34$ m $N = 17$ kW</td>
</tr>
<tr>
<td>8</td>
<td>Volgograd’ka st., 37</td>
<td>4К8 – 1 pcs. 4К12 – 1 pcs.</td>
<td>$Q = 65$ cub.m / hr$H = 61$ m $N = 28$ kW $Q = 65$ cub.m / hr$H = 38$ m $N = 17$ kW</td>
</tr>
<tr>
<td>9</td>
<td>Cadetsky Gay st., 3</td>
<td>WILO CO 4 MVI 806 – 1 pcs. КМ-80-50-200СД – 2 pcs.</td>
<td>$Q = 30$ cub.m / hr$H = 48$ m $N = 8,8$ kW $Q = 48$ cub.m / hr$H = 50$ m $N = 15$ kW</td>
</tr>
<tr>
<td>10</td>
<td>Tarasivska st., 3A</td>
<td>1,5К6 – 2 pcs.</td>
<td>$Q = 8$ cub.m / hr$H = 18$ m $N = 4,5$ kW</td>
</tr>
<tr>
<td>11</td>
<td>Zhelyabova st., 10A</td>
<td>KM100-80-75 – 1 pcs. КМ80-50-210 – 1 pcs. 4К12 – 1 pcs. 2К6 – 1 pcs.</td>
<td>$Q = 61$ cub.m / hr$H = 49$ m $N = 15$ kW $Q = 100$ cub.m / hr$H = 50$ m $N = 15$ kW $Q = 65$ cub.m / hr$H = 38$ m $N = 15$ kW $Q = 10$ cub.m / hr$H = 35$ m $N = 4,5$ kW</td>
</tr>
<tr>
<td>12</td>
<td>Shamrylo str, 6</td>
<td>3К9 – 2 pcs.</td>
<td>$Q = 30$ cub.m / hr$H = 34$ m $N = 13,5$ kW</td>
</tr>
</tbody>
</table>
Table 4.2. General requirements for pumpsets
Pumpsets: 1 operating and 1 reserve shall be supplied and installed

<table>
<thead>
<tr>
<th>№</th>
<th>Location (address)</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Glushkova ave, 40</td>
<td>Q = 64 cub.m/hr, H = 29,2 m, N = 7,5 kW, n=2919 rpm. Efficiency 97% Parameter NPSH - 2,2 in duty point</td>
</tr>
<tr>
<td>2</td>
<td>Kablukova str, 9</td>
<td>Q = 150 cub.m/hr, H = 37,1 m ,N = 22 kW, n=2950 rpm. Efficiency 97% Parameter NPSH – 7,26 in duty point</td>
</tr>
<tr>
<td>3</td>
<td>Bahmatska str 10</td>
<td>Q = 30 cub.m/hr H = 53,1 m, N = 7,5 kW, n=2919 rpm Efficiency 97% Parameter NPSH – 1,95 in duty point</td>
</tr>
<tr>
<td>4</td>
<td>Boulevard Lepse, 23</td>
<td>Q = 30 cub.m/hr, H = 44,1 m, N = 5,5 kW, n=2920 rpm Efficiency 97% Parameter NPSH – 1,95 in duty point</td>
</tr>
<tr>
<td>5</td>
<td>Kotelnikova str, 31-37</td>
<td>Q = 21 cub.m/hr, H = 70,4 m, N = 7,5 kW, n=2919 rpm Efficiency 97% Parameter NPSH – 1,8 in duty point</td>
</tr>
<tr>
<td>6</td>
<td>H. Stalingrada ave, 12D</td>
<td>Q = 10 cub.m/hr, H = 57,2 m, N = 3,0 kW, n=2902 rpm Efficiency 97% Parameter NPSH – 2,05 in duty point</td>
</tr>
<tr>
<td>7</td>
<td>Povitroflotsky ave 34</td>
<td>Q = 17 cub.m / hr, H = 33,2 m, N = 3,0 kW, n=2902 rpm Efficiency 97% Parameter NPSH – 1,39 in duty point</td>
</tr>
<tr>
<td>8</td>
<td>Volgogradskra str, 37</td>
<td>Q = 45 cub.m/hr, H = 38,8 m, N = 7,5 kW, n=2920 rpm</td>
</tr>
<tr>
<td>№</td>
<td>Location (address)</td>
<td>Parameters</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 9   | Cadetsky Gay str, 3         | Q = 17 cub.m/hr, H = 44,8 m, N = 4,0 kW, n=2920 rpm  
Efficiency 97%  
Parameter NPSH – 2,31 in duty point  
| 10  | Tarasivska str, 3A         | Q = 10 cub.m/hr, H = 23,1 m, N = 1,1 kW, n=2853 rpm  
Efficiency 97%  
Parameter NPSH – 2,05 in duty point  
| 11  | Zhelyabova str, 10A       | Q = 64 cub.m/hr, H = 44,3 m, N = 11 kW, n=2924 rpm  
Efficiency 97%  
Parameter NPSH – 2,15 in duty point  
| 12  | Shamrylo str, 6           | Q = 88,6 cub.m/hr, H = 33,5 m, N = 11 kW, n=2940 rpm  
Efficiency 97%  
Parameter NPSH – 3,41 in duty point  
| 13  | Kalachevskaya str, 9      | Q = 5,8 cub.m/hr, H = 35,3 m, N = 1,1 kW, n=2853 rpm  
Efficiency 97%  
Parameter NPSH – 1,57 in duty point  
| 14  | Vyshnyakivska str, 5A     | Q = 45 cub.m/hr, H = 51,9 m, N = 11 kW, n=2924 rpm  
Efficiency 97%  
Parameter NPSH – 2,36 in duty point  
| 15  | Vyshnyakivska str, 13Б     | Q = 45 cub.m/hr, H = 59,4 m, N = 11 kW, n=2924 rpm  
Efficiency 97%  
Parameter NPSH – 2,34 in duty point  
| 16  | Dragomanova str, 14       | Q = 45 cub.m/hr, H = 59,4 m, N = 11 kW, n=2924 rpm  
Efficiency 97%  
Parameter NPSH – 2,34 in duty point  
| 17  | Grigorenko ave, 3A        | Q = 45 cub.m/hr, H = 59,4 m, N = 11 kW, n=2924 rpm  
Efficiency 97%  
Parameter NPSH – 2,34 in duty point  
| 18  | Kharkiv shose, 21         | Q = 90 cub.m/hr, H = 65,3 m, N = 22 kW, n=2947 rpm  
Efficiency 97%  
Parameter NPSH – 2,34 in duty point  
| 19  | Kharkiv shose, 58A        | Q = 10 cub.m/hr, H = 57,2 m, N = 3 kW, n=2902 rpm  
Efficiency 97%  
Parameter NPSH – 2,05 in duty point  
| 20  | Alma-Atynska str, 39      | Q = 30 cub.m/hr, H = 69,7 m, N = 11 kW, n=2924 rpm  
Efficiency 97%  
Parameter NPSH – 1,98 in duty point  

Table 4.3. Drainage pumps requirements
5. Characteristics of the impacts of the projected activities on the environment and the social sphere

Successful implementation of the project involves precisely defining the types of project impacts on the environment and the social sphere and, accordingly, assessing the environmental and social impacts of the project. The potential impact of the planned activity on the components of the environment and the social sphere should be considered both during the construction phase and during the operation of the reconstructed object.

The assessment of potential impacts is based on current legislation that regulates environmental issues in the country in which the project will be implemented. The legal, economic and social bases of the organization of environmental protection are regulated by the Law of Ukraine No.1264-XII "On environmental protection" dated 25.06.1991. In accordance with Article 51 of the said Law of Ukraine "during the design, placement, construction, commissioning of new and reconstruction of existing enterprises, facilities and other objects, improvement of existing and implementation of new technological processes and equipment, as well as during the operation of these facilities ecological safety of people, rational use of natural resources, observance of norms of harmful influences on the environment is ensured. This should include the capture, utilisation, disposal of harmful substances and wastes or their complete elimination, fulfillment of other requirements for the protection of the environment and human health."

A compulsory part of the Environmental impact assessment report in accordance with the current legislation is the description and assessment of the possible environmental impact of the planned activity, in particular the magnitude and extent of such impact (the area of the territory and the population that may be affected), the nature (if there is - a transboundary), intensity and complexity, probability, expected start, duration, frequency and inevitability of influence (including direct and any indirect, indirect, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects). However, it should be noted that in accordance with the Criteria for the definition of planned activities that are not subject to environmental impact assessment, approved by the Resolution of the Ministers of Ukraine No. 1010 from 13.12.2017 the project does not foresee the development of an Environmental impact assessment. In general, during the implementation of the project connected with the reconstruction of the pump at the water supply station of the Desnianska IIIrd water pump station with the introduction of energy saving equipment and frequency regulation, it is assumed that there is no probability of occurrence of certain types of negative influence on the state of the environment and social sphere.

However, it should be noted that there are possible temporary inconveniences, the action of which will be minimized or eliminated at the expense of the implementation of appropriate mitigation measures indicated in Annex No. 3.

Direct consequences:

- Ensuring better quality of water supply services provided to consumers.
- Minimization of breaks in the provision of water services due to reduced network accidents.
- Providing the best working conditions for employees of the communal enterprise.
– Creation of additional workplaces for the period of reconstruction works.
– Saving energy resources by increasing the efficiency of the pump equipment.
– Implementation of optimal schedules for adjusting energy consumption depending on the volume of drinking water consumption by automating the pumping process.

Indirect effects:
– Prevention of inconveniences caused by contamination of adjacent areas.
– Prevention of inconvenience due to breaks in water supply and sewage services.
– Increased control over the provision of utilities.
– Reduction of indirect influence on the environment by increasing the energy efficiency of the process of pumping drinking water.
– Application of existing engineering infrastructure, including centralized water supply, drainage, power supply, without additional environmental interference.
– Exclusion of soil pollution by chemical, biological pollutants.

**Air pollution**
Period of implementation of works related to the realisation of an investment project, the temporary impact on the state of the air is determined by the following technological operations:

– welding works, which are used in the process of installation (dismantling) of metal structures;
– construction and installation work;
– dyeing works using primers and enamels containing light organic solvents;
– working engines of motor vehicles engaged in the supply of materials and waste removal.

The execution of the specified works, in turn, involves the release to the atmosphere:
– the receipt of additional volumes of pollutants from the working engines of motor vehicles engaged in the supply of materials and waste disposal, namely: carbon oxide, nitrogen dioxide, soot, sulphur dioxide, hydrocarbons, methane.
– receipt of additional volumes of pollutants from the processes of conducting welding operations, namely: carbon oxide, nitrogen dioxide, as well as metal compounds (iron oxide, manganese and its compounds);
– receipt of additional volumes of pollutants from the processes of painting (priming) of metal surfaces, namely butyl acetate, acetone, toluene, xylene;
– emission of substances of undifferentiated compound as a result of construction and installation work;
– formation of additional physical influence (noise) as a result of operation of motor vehicles engaged in the supply of materials and the removal of waste;

Emission of pollutants into the air will be unorganized. The detailed description of the source of emission of pollutants, the parameters of the source of emissions, the name of the sources of pollutants, the values of concentrations and mass emissions of pollutants are given in the assessment of environmental impact, which is part of the design documentation.
The described impact will have a short-term and local character, which will be created in the work areas of construction machinery. The negative impact on the quality of the air will take place mainly near the site where the construction works are carried out. Despite the fact that the objects of reconstruction are located within residential areas, there will be no impact on the living conditions of the population. No emissions are expected at the construction and operation of the projected facility.

**Operational stage**
During the period of operation of a water supply pump station, the reconstruction of which is expected during the implementation of this investment project, no negative impact on the state of the environment and social sphere is expected. The risk of accidents is minimized by carrying out reconstruction work. Since the project does not provide sources of pollutant emissions into the air, the deterioration of the air basin after the implementation of project decisions is not predicted. In addition, due to the introduction of more energy efficient equipment, optimization of the use of electric energy and, consequently, positive influence on the state of atmospheric air are expected.

**Effect on climate and microclimate**
Implementation of this investment project will not involve the implementation of emissions into the atmosphere of inert gases, additional amounts of heat and moisture. Climatic conditions in the location of the object contribute to the dispersion of pollutants in the atmospheric air. The emergence of excessive concentrations of pollutants in the surface layer of the atmosphere due to adverse climatic conditions is not expected. Possibilities of the emergence of climatic conditions that contribute to the spread of harmful species of fauna and flora are absent. As a result of operation of the object of reconstruction, change in climate and microclimate are not expected.

**Impact on surface and groundwater of water at the site of construction work**
Due to the implementation of project solutions on the construction of the object change in volumes of water consumption and drainage will not occur. During the period of dismantling and construction work, there is a risk of accidental leakage of fuel and lubricants from machinery and equipment and waste materials used in construction. These substances can pollute soils and, accordingly, get into groundwater or drain into surface water bodies. Physical pollution of surface water by solid construction and household waste is not excluded. And by fine particles in the air.

**Operation stage**
There is potential negative impact on surface and groundwater, the probability of which appears during the operation of the facility through the possibility of an emergency leakage of fuel and lubricants of vehicles and sewage leakage. Groundwater pollution is possible only if technology is not followed or due to staff error.

**Impact on soil condition and landscape**
The main impact on the soil will be related to the construction and erection works. The works do not involve conducting a spectrum of earthworks, but there is a possibility of a risk that will be expressed as:
– mechanical pollution due to improper treatment of waste due to the formation of an additional amount of waste, construction waste with a total weight of 132.2 tons of
– chemical contamination at the expense of possible emergency spills of fuel and lubricants during the operation of construction machinery;

The impact on the landscape is not expected. It should be noted that the risk of negative impact will be minimal due to the fact that the reconstruction will already take place on the existing facility, and the project documentation provided by the range of construction and installation works will be on the territory of the existing production facility of the pump station. During the execution of works, strict compliance with the design requirements is stipulated. Impact on soils during the operation of the reconstructed object is not expected.

**Impact on historic, cultural heritage**

It is anticipated that the project will have no impact on historical, cultural or religious sites or monuments. At the same time, if some sub-projects will have an impact on the location of the cultural heritage, the procedures provided for in the Operational Policy of the World Bank OP 4.11 "Material cultural heritage” to prevent or minimize potentially negative impact shall be applied.

**Landslides and erosion**

Project documentation and procedure for the implementation of work does not involve the use of building processes that would lead to such negative effects as landslides and erosion. During the operation of the facility there is no risk of landslides and soil erosion.

**Waste management**

During the implementation of measures for the reconstruction of water supply systems there is the formation of the following types of waste:

– The scrap of ferrous metals, another small waste (spent parts of the technological equipment of ferrous metals).
– The scrap of ferrous metals, another small waste (electrode stubs).
– Waste generated in the process of cleaning the streets, places of common use (construction debris).

Waste belongs to the 3-4-th class of hazard and is, accordingly, less hazardous (according to the sanitary-hygienic norms of Ukraine) non-toxic and not belonging to the list of hazardous wastes.

Potential impact of waste management is due to the possibility of their improper temporary storage and transportation. This, in turn, can cause pollution of the soil and cause the pollution of the natural environment and create a danger to human health along the route of transportation of waste.

Given the expected storage of waste in accordance with sanitary norms and safety, their subsequent delivery to specialized enterprises, landfill dumping, so that it can be concluded that the negative impact of the object on the environment will be within acceptable limits.
Operational stage
During the period of operation of the facility, the reconstruction of which does not anticipate the formation of new types of waste is not expected compared with the list of those that were accounted for reconstruction.

Noise
During the construction phase there will be typical noise effects that can not be avoided. Such typical noise effects include the noise effects caused by the movement of trucks and other construction equipment (excavators, bulldozers, tractors, etc.), loading and unloading processes, carrying out assembly and disassembly works, etc.

According to the temporal characteristics, these noise are non-permanent and, depending on the type of work performed, there are:
- oscillating in time (the sound level is constantly changing);
- intermittent (the sound level of which is gradually changing);
- impulse (consisting of one or more sound signals, each of which lasts less than one second).

Provision on the construction sites of the acoustic regime, which corresponds to hygiene norms, shall be carried out by means of urban planning, building and constructive decisions, administrative and organizational measures (p. 8.40 section DSP-173-96 "Protection against noise and vibration").

According to the calculations, the expected noise levels from noise sources during the reconstruction at the boundary of residential development are below the permissible values (given that the reconstruction is carried out during daylight hours), it is assumed that the main sources of noise at the construction site will be:
- new pump units, located in the room of the engine room;
- Motor vehicles involved in the supply of materials and waste.

In order to determine the correspondence of the level of sound pressure to the established sanitary norm in assessing the impact on the state of the environment, calculations of the expected level of sound pressure at the boundary of residential development, located in the southern direction at a distance of 148 meters, have been performed. It is determined that the expected equivalent level of noise on the boundary of public building does not exceed 25.6 dBA during the day.

As a result of the implementation of design solutions increase of the sound load is not expected. Noise will be periodic and will be observed only during the day in accordance with the current legislation of Ukraine or at appropriate times, if such will be stipulated with local residents during public hearings / discussions. In turn, construction work will not require activities that generate significant noise, such as explosions. Upon completion of the reconstruction, the noise level in the area will return to the existing one.

Operational stage
When the operation of the reconstructed object is assumed, the main sources of noise will be
new pump units, located in the premises of the engine room. The existing level of sound load is within 30 dBA during the day, which does not exceed the level of sound pressure set in the residential building, given in Table 1 of DBN V.1.1-31: 2013. No increase in the level of sound pressure due to the implementation of design decisions is expected. Thus, the deterioration of the social environment in the area of placement of the construction will not occur.

The impacts associated with the closure and dismantling of facilities of the enterprise Disabling of the object of reconstruction is not expected. The main environmental impacts are related to the dismantling of existing equipment and are limited to those that are consistent with the general types of environmental impact described in the relevant sub-sections of this section.

**Risk of road traffic accidents.**
A slight increase in the intensity of road traffic of heavy machinery and trucks to and from sites of the construction works under the project of reconstruction, transportation of building materials and construction equipment, as well as direct execution of work related to the reconstruction of the pump station water involves minor change speed limits, which in turn may affect on the probability of risk of accidents. It should be noted that this impact will be of a temporary nature and will be localized near the areas of direct execution of works by developing traffic management plan.

**Impact on flora and fauna**
Construction work during the reconstruction of a water supply pump station will not involve land works related to the use of a number of special vehicles. This, in turn, will not cause a risk of an impact on the condition of the plant cover, as all work will be limited to the execution of works directly in the premises of the station. Mechanical impact due to the compression effect of heavy equipment on the state of the vegetation cover is excluded, since it is not expected that the movement of machinery outside the surfaces with asphalt-concrete coating could lead to a disturbance of the vegetation cover of the place. VThe cutting of woody shrub vegetation in the process of project implementation is also not expected.

Also, during construction, there may appear excitation factors such as noise and vibration, which can adversely affect some species of birds that have urban habitats. However, given that the territory of the reconstruction is residential, this impact can not be taken into account. On the territory of the reconstruction sites, as well as in the zone of influence of the object of reconstruction, there are no objects of the Natural reserve fund and red-book species. Agricultural land will not be affected during construction.

**Operational stage**
The operation will take place within the residential areas and on the territory of previously operating facilities, due to which additional negative consequences are not foreseen, and the existing negative consequences will be minimal. As for the representatives of the vegetation types included in the Red Data Book of Ukraine, they are absent on the territory of existing facilities in the area of implementation of this investment project.
Impact on the land use of Kyiv

The construction process involving the implementation of this investment project will involve work within the limits of the existing order of land use. Work on the reconstruction of a water pump station does not foresee the use of additional land plots. Carrying out works on lands with a special status of land use is not expected. All planned interventions will be performed under current communal land plots registered with Kyivvodokanal for their use.

Operation stage In the period of operation of facilities, reconstruction of which is expected during the implementation of this investment project, the impact on land use regime is absent. Influence on the objects of the natural reserve fund On the territory of the investment project and within the sanitary-protective zone of the existing water pump station there are no objects of the nature reserve fund. Thus, there is no risk of a negative impact on the state of the objects of the nature reserve fund during the reconstruction and during its further exploitation.

Emergency risk.

For this construction site, the possibility of occurrence and development of an emergency situation, which can lead to irreversible consequences for the environment, is unlikely. Possible emergency situations at the site that will have negative consequences for the environment may be an explosion or fire.

The reasons that can lead to emergency situations may be the failure of equipment due to:

- termination or malfunction of electricity supply;
- violation of operating conditions of equipment;
- errors of repair and maintenance personnel; non-fulfillment of fire safety requirements.

In order to reduce the probability of an emergency, the project provides for a system of measures for safe operation and control, aimed at preventing accidents, preventing their development, limiting scales, consequences, containing technical and organizational measures.

Operational stage

The possibility of emergence and development of an emergency situation, which can lead to irreversible consequences for the environment, is also unlikely. The reasons for the possibility of an emergency during the operation of the reconstructed object are similar to the reasons during construction and installation work. Influence of the projected activity on the social sphere

The potential consequences of the projected activities on the social sphere at the construction stage can be considered in the following terms:

- social management practice;
- working conditions;
- economic environment;
- health and safety of the population;
- Thus, the potential negative influence in the field of social management practice can be expressed in terms of: increasing the number of complaints from local community
members who live in the area of direct construction work due to higher levels of dust, noise, road traffic violations through Construction works.

Potential negative effects in the field of observance of working conditions can be expressed as:

- the use of construction equipment that does not comply with the instructions for its operation, non-compliance with the rules and standards of occupational safety, improper instruction and, accordingly, improper control can lead to situations leading to injury of employees and visitors to the construction site;
- increases the risk of injury to employees;
- violation of employees’ working conditions due to increased noise, vibration and dust.

Potential negative impacts in the field of public health and safety practices can be expressed as:

- disturbing the comfort of living of local residents (local households) located directly in the area of construction work due to the increase of noise, dust (air pollution), violation of the schedule of movement public transport, increase of the traffic intensity of motor vehicles;
- increasing the number of complaints from local community members who live in the area of direct construction work due to a higher level of dust, noise, road traffic violation through construction work.

The assessment of the risk to the health of the population is made solely in terms of the impact in the process of implementation of the project decisions. The assessment of the risk to the health of the population was performed during the development of an environmental impact assessment as part of the developed design documentation in accordance with the requirements of Annex Ж Amendments No. 1 to the DBN A.2.2.-1-2003. The assessment of the risk to the health of the population from atmospheric air pollution is based on calculations of the risk of developing non-carcinogenic and carcinogenic effects. The results of calculating the hazard ratio of pollutants are given in the following table.

**Table 5.1. Calculations of the coefficients of hazardous pollutants**

<table>
<thead>
<tr>
<th>Name of pollutant</th>
<th>Hazard ratio H Q i</th>
<th>Risk Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Determined</td>
<td>Normative</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>0.14</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Butyl acetate</td>
<td>0.003</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Acetone</td>
<td>0.00007</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>
The risk of harmful effects is regarded as disparagingly small.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>0.027</td>
<td>&lt;1</td>
<td>The risk of harmful effects is regarded as disparagingly small</td>
</tr>
<tr>
<td>Xylele</td>
<td>0.13</td>
<td>&lt;1</td>
<td>The risk of harmful effects is regarded as disparagingly small</td>
</tr>
</tbody>
</table>

Total risk of non-carcinogenic effect for the combined effect of chemicals from the design object $HI = 0.53$. Thus, the probability of developing harmful effects in the population is considered as negligible.
Transboundary impact of construction facilities

The Convention on environmental impact assessment in a transboundary context ("the Convention") was adopted in the city of Espoo (Finland) on 25.02.1991 and came into force on 10.09.1997. The Convention was ratified by Ukraine by Law on 19.03.1993, No. 534-XIV. The Convention aims to promote sustainable development through the promotion of international cooperation in assessing the likely impact of planned activities on the environment. It applies, in particular, to activities that may cause damage to the environment in other countries. Ultimately, the Convention aims at preventing, mitigating and monitoring such environmental damage.

Transboundary impacts implies any harmful effects resulting from changes in the state of the environment due to human activities, the physical source of which is fully or partially in an area under the jurisdiction of either Party for the environment in the area under the jurisdiction of the other Party. Such environmental impacts include the consequences for the health and safety of man, flora, soil, air, water, climate, landscape, and historical monuments or other material objects.

The project of reconstruction of the Desnianska IIIrd water pump station with the introduction of energy saving equipment and frequency regulation is not included in the list of activities requiring the application of the Convention in the event of a significant transboundary impact on the environment Annex I to the Convention.

Excessive levels of MPC pollutants outside the SPZ is not expected. The standardization of the sanitary protection zone for this type of objects in accordance with the "State sanitary rules of planning and development of human settlements" (DSP-173-96) is not expected. According to the requirements of DBN 2.5-74: 2013 "Water supply. Extranets and structures» for the objects of centralized water supply, zones of sanitary protection are established. For the object of reconstruction in accordance with the requirements of p.15.2.3 of DBN 2.2-74-2013, the boundary of the first zone of the sanitary protection zone of plumbing facilities shall be established from the walls of tanks of filtered (drinking) water, filters shall be not less than 30 m, from the walls of other structures - not less 15 m Thus, the sanitary protection zone for the reconstruction object is sustained. Thus, the operation of this convention does not apply to this type of work.
6. Mitigation measures of negative impacts on the environment

During process of the investment project implementation will be envisaged a whole set of measures that will ensure compliance of the project with the applicable norms and rules, safe operation of equipment and vehicles and reduction of pollution level of atmospheric air by harmful substances. During construction it is planned to use qualitative types of fuel, to provide proper ventilation, to prohibit the work in closed premises or limited space, employees in the proper quantity should be provided with respirators.

Taking into account the requirements of a number normative legal acts of Ukraine, in particular: Law "On Automobile Transport" dated 5.04.2001 №2343-III, "Rules of Operation of Wheeled Vehicles", approved by the Order of the Ministry of Infrastructure of Ukraine dated 26.07.2013 №505, and the "Rules of Battery Operations lead-acid starter batteries of wheeled vehicles and special machines made on wheeled chassis", approved by the Order of the Ministry of Transport and Communications of Ukraine dated 2.08.2008 №795, the technical condition of the used technics should be in satisfactory condition, and all emissions related to the work of internal combustion engines do not exceed the established standards. This will ensure the use of the equipment only in the normal condition.

Waste management

Construction waste that are formed during the construction and installation work will be stored in special containers or in specially designated places in accordance with their aggregate condition and hazard class near the place of work. The packaging used for temporary storage should have the appropriate markings. Temporary storage of waste and its subsequent transportation for subsequent processing or disposal in accordance with the concluded agreements will envisages.

It is envisaged to conclude contracts with a specialized waste removal company. In addition, it is mandatory to provide in the briefings the issue of waste management.

Impact on groundwater condition

The planned reconstruction will not lead to deterioration of water quality. It is assumed that the work will be carried out in strict accordance with the design conditions, which will minimize the risk of negative impact. It is planned to develop a plan for handling emergency situations in the event of an emergency spillage of fuel and lubricants or the occurrence of accidents on reconstructed water supply networks.

The impact on groundwater condition is possible only in case of emergency situations, its prevention is envisages in emergency measures, the development of a reaction plan in the event of emergencies. This is guarantee the avoidance or mitigation of pollution of surface and groundwater both during the construction period and during operation of. All involved performers must undergo appropriate training, and obtain a certificate for the right to perform work with increased danger, to be briefed before the work.

Noise
Construction works will be limited in the time interval from 8\textdegree to 21\textdegree, in accordance with the current legislation of Ukraine or in accordance with conditions agreed with the locals. In order to reduce noise level, it is also envisaged to optimize the traffic flow associated with construction work, including the elimination of delivery of goods at night.

Workers should be provided with noise protection means.

If necessary, the installation of noise shields near the construction equipment is planned to prevent negative effects.

**Emergency warning**
Compliance with work schedules and regulations on occupational safety is mandatory for preventing emergencies. All involved performers must undergo appropriate training, and obtain a certificate for the right to perform work with increased danger, to be briefed before the work. At the places of work, appropriate warning and warning signs will be displayed, appropriate fences and transitional bridges (if necessary) installed in accordance with the requirements of the current legislation of Ukraine.
7. **Mechanism of implementation of external communications, disclosure of information and processing of appeals of the population**

In the process of realization of this investment project, an important element is the holding of public consultations and direct participation of the public and, in particular, project stakeholders, who may be adversely affected by the project. This is a condition for reducing the likelihood of emergence of conflict situations and increasing the positive effects in the process of project implementation. Stakeholders refer to natural or legal persons (institutions, organizations) whose state (economic, social, etc.) may change as a result of the implementation of the proposed project. The consultation process involves working with all project parties identified as project stakeholders. The involvement of the public, in particular the project stakeholders, in order to familiarize themselves with the project is the essential conditions for its implementation and PrJSC “Kyivvodokanal” determines the public opinion before the start of construction work.

The mechanism of public consultations of PrJSC “Kyivvodokanal” is being implemented through:
- public discussion;
- public hearings;
- providing advice to the public (upon request).

Conducting public consultations, in particular public hearings, public discussions and stakeholder consultation on an individual basis, will minimize the likelihood of complaints by processing issues and solving problems associated with project implementation in the regular course of work. In case of questions, suggestions or complaints, the person concerned may apply to PrJSC “Kyivvodokanal”.

Grievance redressal is important component of effective stakeholder engagement. The purpose of GRM is to provide a way to the internal and external stakeholders to voice their concerns, queries and issues with the project. Such a mechanism would provide the stakeholders with one-one channel through which their queries will be channelled and will ensure timely responses to each query. This will allow for trust to be built amongst the stakeholders. The GRM will be accessible and understandable for all stakeholders in the project and for the entire project life. The GRM will be communicated to all relevant stakeholders and will also be applicable for any contractor.

The objectives of the grievance mechanism are to:
- Provide accessible available methods to contact for all external stakeholders to contact Kyivvodokanal Utility;
- Ensure an effective, timely and reasonable approach for solving the problems of stakeholders;
- Identify and monitor process of reconstruction and all possible related stakeholder issues to support effective stakeholder and risk management;
- Meet requirements of national and international best practice.
Kyivvodokanal Utility communicate with help of this procedure to its external stakeholders to raise awareness and offer transparency of how stakeholders can voice their grievances. Various channels for external stakeholders to vocalise their grievances formally include:

- **Telephone.** Stakeholders can call Kyivvodokanal’s Call centre on (044) 202-02-02 and record a complaint or suggestion.
- **Individual consultations at the hour of admission.** Stakeholders can voice their grievance to responsibility persons. The reception schedule is located at the link https://vodokanal.kiev.ua/grafik-prijomu-kerivnicztya.
- **Using the social networks.** Kyivvodokanal’s link is https://www.facebook.com/vodokanal
- **by means of a written application to PrJSC “Kyivvodokanal”.**
- **by means of an electronic application.** Written appeal can also be sent using the Internet. For this purpose, the website of PrJSC “Kyivvodokanal” consists the page "To ask", where anyone can leave their application (a question, a proposal or a complaint) with their contact details for feedback, including full name, address, contact number, e-mail address and residence address.

Consumers can register their applications either through utility service centres or through customer service centers.

A significant role for the provision of information to consumers in different areas is performed by PrJSC “Kyivvodokanal” website https://vodokanal.kiev.ua. In addition, for convenience of service consumers Kyivvodokanal has launched a personal subscriber's accounts. They keep the entire history of the relationship between the consumer and the Kyivvodokanal. Moreover, it is now possible not only to send out indicators, but also to pay for utilities at any time, through the personal account, to view the consumption history and to generate reports, to control the charges and payments on his personal account, to print out bills, to keep bills at several addresses, at which relatives or tenants live.

The implementation of the billing system provided the residents with the opportunity to receive consultations and other services at any department of the Municipal service center, regardless of their place of residence or registration. Its worth noting that information regarding possible planned activities like introduction of additional services or tariff change is also available at the bills. It is worth noting that according to the current legislation of Ukraine, a written request should be sent by mail or transmitted through authorized person, whose authority is issued in accordance with the law.

*It should be noted that, in accordance with the World Bank's policy, appeals, offers and complaints of citizens are accepted for consideration, even without the indication of the contact details of the person applying (anonymous requests), in contrast to the requirements of the current legislation of Ukraine.*

In accordance with Article 7 of the Law of Ukraine No. 393/96-VR "On citizens' appeal" from 02.10.1996, if the resolution of the issues specified in the application are not in the authority of PrJSC “Kyivvodokanal”, the enterprise shall send an application to the appropriate body or
official within a period of not more than five days, which is reported to the citizen who submitted the application. In accordance with Article 20 of the Law of Ukraine "On appeal of citizens", applications are considered and resolved within a maximum of one month from the date of their receipt. If it is not possible to resolve the issues raised in the appeal within a one-month period, the necessary period for its consideration is established, which is communicated to the person who submitted the application. However, the general term for resolving issues raised in the application can not exceed forty-five days.

In order to increase the efficiency of work with appeals, PrJSC “Kyivvodokanal” provides personal reception of citizens by the head of the company and managers of the profile structural divisions of the enterprise according to the established schedule. The reception schedule and contact numbers are also published on the site of PrJSC “Kyivvodokanal”.

Reports, complaints or proposals related to the implementation of the project will be considered through negotiations, the main objective of which is to achieve a mutually acceptable solution. In the event that the issue was not resolved or the person who contacted PrJSC “Kyivvodokanal” did not receive a response, he may apply to the appropriate local authority specialist (for which the functions will be assigned at the time of the project implementation). The contact details, the time of admission will be made public during the public discussion of the draft of this plan.

The procedure for the handling of complaints by citizens, the processing of complaints must be submitted at the local level during public deliberations or public hearings on the issue of this plan. In case of impossibility of solving citizens' complaints related to compensation of damages caused by the implementation of the Project in the course of negotiations, the parties, in accordance with the current legislation of Ukraine, have the right to resolve these issues in court. In turn, the submission by a citizen of an appeal containing defamation and offences, discredit of officials of the enterprise, appeals to instigate national, racial, religious hatred and other actions entails the responsibility provided for by the current legislation of Ukraine. In accordance with Article 27 of the Law of Ukraine "On citizens' appeal" The costs incurred by the enterprise, the association of citizens, the mass media in connection with the verification of appeals, which contain knowingly false information, may be charged to a citizen by the court decision.
8. Occupational safety and health

8.1. Safety and occupational protection at the enterprise

A safety management system is developed and operates at the enterprise. The system of occupational protection is aimed at preparing the adoption and implementation of decisions on the implementation of organizational, technical, sanitary and hygienic and medical preventive measures aimed at creating safe working conditions, preserving the health and working capacity of people at enterprise. The object of the OSH is the activity of structural departments of the enterprise and functional services of enterprises, aimed at creating safe and healthy working conditions in the workplace, in production divisions and at the enterprise in total. The occupational protection management provides for the solution of the following main tasks:

– ensuring optimal conditions of work and rest of employees;
– studying and promoting occupational safety issues;
– guarantee of safety of production processes;
– guarantee of the safety of buildings and structures;
– creation of appropriate psychological support of production;
– creation of appropriate sanitary and hygienic working conditions;
– provision of working means of personal protection;
– organization of medical and preventive maintenance of employees.

Throughout the whole term of the Contract:

– provide accommodation and living conditions for their employees,
– to use all reasonable safety measures and mitigation measures to ensure the health and safety of Contractor's personnel.

In cooperation with local health care providers, the Contractor shall ensure the constant access to medical personnel, first aid, ambulances and ambulances at the polling stations and places of placement of the Contractor's and Customer's personnel, as well as to ensure appropriate measures to comply with all necessary household and sanitary-hygiene requirements and prevention of epidemics. The contractor must assign responsibility for the prevention of accidents at polling stations, safety equipment and accident protection. This employee must have the necessary qualifications to carry out these functions, and should has authority to issue instructions and organisarion preventive work to prevent accidents.

During the contract period, the Contractor must provide the employee with everything necessary to fulfill his duties and authority. The Contractor shall send to the Project Manager detailed information on any accident as soon as possible after the incident. The Contractor shall maintain documentation and prepare reports on health care and measures to ensure the safety of workers, as well as reports in case of damage to property that may reasonably be claimed by the Customer.

Occupational health and safety management provides for the following main tasks:

– ensuring optimal working conditions and rest of workers;
– studying and promoting occupational safety issues;
– guaranteeing the safety of production processes;
– guaranteeing the safety of buildings and structures;
– creation of appropriate psychological support for production;
– the establishment of appropriate sanitary and hygienic working conditions;
– provision of working means of personal protection;
– organization of treatment and preventive maintenance of workers.

The head of the Utility, together with the responsible persons, supervises the labour protection system and checks the working conditions, observance of requirements of normative acts on labour protection in divisions and services. The main types of control in an enterprise are current and selective control. Control of labour protection involves checking compliance with the employees safety requirements during technological processes, rules of operation of machines, mechanisms, equipment, the use of collective and personal protection equipment.

The responsible persons of enterprise also controls the occupational safety in certain structural departments and services.

During implementation of work envisaged by project, labour protection must be provided by:
– organization of work processes, in accordance with the requirements of sanitary norms;
– mechanization and automation of heavy and hazardous works;
– availability of appropriate personal protective equipment for workers (special overalls, shoes, protective helmets, etc.);
– availability of appropriate means of collective protection of workers (fencing, lighting, ventilation, protective and safety devices and devices, etc.);
– sanitary and domestic service includes the organization of industrial and domestic premises: for the storage of clothing, personal hygiene, rest, heating and cooling of workers, care for overalls and personal protective equipment, medical care and room for meals. Performed in the form of inventory facilities (mobile, container, prefabricated). Sanitary facilities and equipment should be put into operation before the start of construction work;
– organization of sanitary-and-health services (especially preliminary and periodic medical examination) in accordance with the requirements of the applicable norms and specifications of the work performed.

Responsibility for the definition and implementation of effective occupational safety measures is on the Contractor. The proposed measures shall be included by the Contractor to the Construction Organization Project and agreed with the Utility. After the Customer's approval, the Construction Organization Project must be included in the Work Program and, if necessary, updated. Particular requirements for occupational safety, if any, should be described in a separate section of the Project. The approval by the Customer of the Construction Organization Project does not relieve the Contractor of responsibility for the safe execution of works, and this statement should not be interpreted as transferring responsibility, in whole or in part, to the Customer.

All personnel involved in the work must successfully complete training in occupational safety and health in accordance with the Law of Ukraine "On Occupational Safety and Health". The
training should include, in particular, complete information on occupational safety, fire safety and hygiene of personnel involved in the performance of fire hazard operations. It is necessary to receive additional special training before the beginning of the work (documentary evidence must be provided).

For the performance of work, the Contractor shall not employ personnel who may be ill with a disease transmitted by water or being the carrier of a disease transmitted through water. The Customer may require that the Contractor at his own expense send such a person to a medical examination to confirm his health by obtaining a health certificate.

The person, responsible for compliance with labour protection requirements, appointed by the Contractor, is entrusted verification of compliance with safety rules in accordance with applicable law.

According to the project of construction organization, organization of the construction site, areas of work and workplaces should ensure the safety of work at all stages of work.

On the territory of the construction site, zones of permanent or potentially dangerous factors are determined, namely:
- work near uninsulated current-conducting parts of installations, between security zones of air lines of power transmissions, between zones where there is a danger of electric shock;
- work near the not fenced transitions in height of more than 1.3 m, storage of materials, moving cars, installation of supports: must be carried out beyond the boundary of the prism of the collapse;
- work in the places of moving vehicles and equipment or their working parts: hazardous areas near the moving parts is 5 m, if there is no other requirements of the manufacturer;
- work in places laying underground communications.

Hazardous areas must be marked with signs in accordance with the requirements of GOST 12.4.026-76 "SSBT. The colours of the signal and the safety signs" and fenced in accordance with the requirements of GOST23407-78 "Inventory fences for construction sites and sites for construction and installation work ".

Before construction and installation work is allowed to proceed only with the presence of a plan of work, agreed with the safety services of construction and installation organizations.

For construction and installation work are allowed:
- an introductory briefing (conducted with all workers and employees, regardless of profession, before hiring);
- instruction in the workplace (conducted before admission to work, this type of instruction should be accompanied by a demonstration of safe working methods);
- repeated instruction (conducted with workers, regardless of their qualifications, seniority and work experience at specified intervals);
– unscheduled briefing (conducted in cases of changes in the rules on labour protection, technological process, violation of the rules of safety rules, in case of accident, with breaks in work more than 60 days).

During the period of the Contract (including the Period of Responsibility for Defects), the Contractor:
– provide information, conduct trainings and advisory activities, for all employees employed at the sites (including Contractor personnel, all Subcontractors and Customer, Team Leader team members) and residents of the surrounding areas regarding risks, dangers and types of exposure, as well as measures for the prevention of sexually transmitted diseases (STDs) or transmitting infections Xia (STI) in general and HIV particular;
– provides for all employees on the site, access to a special national program on STI and HIV/AIDS prevention, testing, diagnosis and counselling services (unless otherwise agreed by the Parties).

All personnel involved in the work must successfully complete training in occupational safety and health in accordance with the Law of Ukraine "On Occupational Safety and Health". The training should include, in particular, complete information on occupational safety, fire safety and hygiene of personnel involved in the performance of fire hazard operations. It is necessary to receive additional special training before the beginning of the work (documentary evidence must be provided).

The contractor should include in the program a plan of STI, STD, including HIV / AIDS prevention measures, among the employees employed at the construction sites. In the plan of STI, STD, and HIV / AIDS prevention measures, the terms, as well as the methods and means that the Contractor intends to use to fulfil the requirements of this clause, should be specified. Each component of the plan should detail the resources allocated or used, as well as any proposed Subcontract.

For the performance of work, the Contractor shall not employ personnel who may be ill with a disease transmitted by water or being the carrier of a disease transmitted through water. The Customer may require that the Contractor at his own expense send such a person to a medical examination to confirm his health by obtaining a health certificate.

The contractor must not involve children in carrying out works that are exploited in a financially sound manner, may be dangerous or prevent the child from obtaining education, or cause negative consequences for the child's health or physical, mental, spiritual, moral or social development.

Construction sites, workstations, workplaces must be provided with the necessary means of collective and individual protection, primary fire fighting equipment, and communication and signaling equipment.

According to Art. 8 of the Law of Ukraine "On Occupational Safety" on work with harmful and dangerous working conditions, and on work related to pollution, unfavorable weather
conditions, workers are given free (at the expense of the employer) special clothing, special footwear and other personal protective equipment, in accordance with to NPABO 0.00-4.01, NPABO 45.2-3.01.

Personal protective equipment as provided for in regulatory enactments on labor protection should be provided to employees, depending on kind of work and working conditions for the period of wear, which in any case must not exceed the expiry date specified by the manufacturer's documents (instructions for use, passports etc.). Personal protective equipment must complete the requirements of the standards, in particular GOST 12.4.011-89 "SSBT: means of protection of workers. General requirements and classification".

Personal protective equipment is used only for its intended purpose in accordance with the operating instructions, which must be understandable for workers. Their requirements should be included in the relevant sections of the documents which are required to perform by the employees (instructions for labor protection, technological regulations, etc.).

If necessary, adequate lighting should be organized at the construction site. It should be uniform and sufficient for the construction process and comply with building codes and regulations (DBN V.2.5-28-2006 "Natural and artificial lighting, Normative", GOST 12.1.046-85). Lighting is carried out by means of general uniform or localized lighting and local lighting - inventory risers or portable devices.

Persons Responsible for loading and unloading work, at the time of appointment, must undergo a check of knowledge of the features of the technological process, work safety requirements, devices and the safe operation of lifting equipment, fire safety and industrial sanitation in accordance with their official duties. Loading and unloading operations with heavy and oversized cargo are performed under the guidance of a specially foreseen person. Loading and unloading operations, as a rule, must be mechanized. The loading of motor vehicles by materials and structures is carried out in accordance with its load-carrying capacity, and the existing requirements for the dimensions of the goods transported. In this case, it is necessary to ensure a stable position of goods during their transportation.

Safety of loading and unloading operations is ensured by the correct placement of workers, instruction and training on safe working methods, appropriate selection of load lifting mechanisms, auxiliary and rigging devices.

Employees engaged in loading and unloading work are required to undergo preliminary and periodic medical examinations in accordance with the requirements of the Ministry of Health of Ukraine. Persons admitted to loading (unloading) of dangerous and especially dangerous cargoes must undergo special training with further certification and use of personal protective equipment. Employees when they receive personal protective equipment should be instructed how to use them and familiar with the requirements for their care.

The mechanized loading and unloading operation is mandatory for a mass of cargo of more than 50 kg and lifting them to a height of more than 3 m. Permanent cargo handling points and warehouses are equipped with mechanized and semi-mechanized equipment: cranes, forklifts, bucket elevators and others. Cars
Persons are allowed to perform electric welding works in case if they are 18 years old or over, and they have passed a medical examination, have trained in the theoretical and practical training program, persons who have passed the examination of the qualification commission and have a certificate of the established sample and who have been assigned the Safety Group II. Female subjects can be allowed to perform manual electric arc welding only on outdoor platforms, not indoors. Each electric welder can be admitted to work only after passing an introductory (introductory) training on safety of work, industrial sanitation and fire safety, instructing in the workplace, which should be carried out at each transition to another job or when working conditions are changed. Repeated training is carried out at least once every three months. An instruction is recorded in a special journal.

Electric welder must be equipped with the necessary means of personal protection - tarpaulin suit, shoes, shields, masks with light filters during the welding of the ceiling, in addition to overalls, footwear and gloves, welders should also get a helmet, asbestos or tarpaulin armbands, and during the welding of nonferrous metals and alloys containing zinc, copper, lead - respirators and chemical filter.

Clothing and gloves of a welder should not have traces of oil, fat, gasoline, kerosene and other flammable liquids.

The admission of workers to the roofing work is allowed after inspection by the responsible persons of the suitability of the roof structures, during the work on the roof with a slope of more than 20°, workers must apply safety belts, safety ropes, non-slip shoes. If the roof is wet or covered by frost or snow if the roof is covered with frost or snow for the workers’ passage, it is necessary to arrange stairs with a width of at least 0,3 m with transverse bars for the rest of the legs.

Applicants who have been trained in a special program with appropriate certificates may be admitted to plastering work. For work on the preparation of chlorinated solutions allowed persons under 18 years of age who have undergone a medical examination and special training on the safe preparation of chlorinated solutions.

Personnel under the age of 18 years who are trained, certified and having the appropriate certificate may be admitted to the plastering work in a mechanized way; Operators who apply a plaster solution using a nozzle should be provided with protective eyepieces. Workplaces of plasterers-operators, nozzles must be necessarily connected with sound and light signaling with workplaces of motorists plastering machines. Workers servicing concrete mixing units must use personal protective equipment - overalls, respirators, headphones, etc. When making a concrete mixture using chemical additives it is necessary to comply with the safety requirements for the prevention of burns of the skin and eyes of the workers.

During excavation work on the territory of settlements or on production areas, pits, trenches, etc. (slots) the places where is the movement of people and transport shall be fenced.
In transition areas through the trenches there should be installed transitional bridges with a width of not less than 1.0 m, fenced on both sides with railing.

At the construction sites should be placed relevant information signs and indicators.

At the construction site it is necessary:
  – to develop measures to ensure fire safety;
  – appoint a person responsible for monitoring fire safety of a person;
  – to comply with the requirements of fire safety; all facilities must be equipped with fire fighting equipment, water for fire extinguishing, fire extinguishers, etc. (In accordance with GOST 12.4.009-83).

In accordance with the Law of Ukraine "On Labor Protection" for the control over safety and health of labor in construction companies engaged in construction, a labor protection service should be developed and implemented.

Before entering the construction site, a traffic scheme must be installed, and on the sides of the access roads - the corresponding road signs. The speed of movement in the work area should not exceed 5 km / h.

Storage of materials, structures and equipment must comply with the standards and specifications of materials, products and equipment.

The operation of construction machinery, equipment and tools, as well as construction and installation work should be carried out in accordance with DBN 3.2.2-2016.

Work on the construction site must be carried out in accordance with the design of the construction organization by companies that have the appropriate permits / licenses in accordance with the current legislation of Ukraine.

At the entrance to the construction site, a scheme of movement of the transport and pedestrians must be established. Road signs and passage signs must be installed on the road construction site. Hazardous areas should be fenced or exposed warning signs and signals.

In the night time, in addition to the fence, light signals should be installed, the places of work should be well lit.

The speed of motor transport near the construction site should not exceed 10 km/h, and at corners and in working areas of cranes - 5 km/h.

The storage of building materials and products in height should not exceed the norms provided by DBN A.3.2-2-2009.

Electrical safety at the construction sites of works and workplaces should be provided in accordance with SNiP 12-03-2001 requirements "Safety of work in construction".
When participating in the construction of subcontractors, the general organization must develop measures for the protection of labor and draw up a timetable for combined work without which work is prohibited.

On the site where the installation works are carried out, it is not allowed to perform other works and to find outsiders who are not involved in these works.

At the construction site, fire stations with fire fighting equipment should be installed, as well as identified especially dangerous zones in the fire and operating modes of these zones.

In order to prevent accidents on construction, special attention should be paid to the operation of lifting machines. The rules of their operation are described in the DNAOP 0.00-1.03-02 "Rules of construction and safe operation of load-lifting cranes".

When working with machines and mechanisms, you must comply with safety rules:
- location of construction machinery is determined in such a way as to provide sufficient space for inspection of the working area and maneuvering, subject to the safety distance near the unclosed slot, piles of goods, equipment;
- persons who are responsible for the condition of the machines must check their technical condition and the procedure for conducting a review of each change not later than once in 10 days;
- the administration of the organization, which carries out construction and installation work with the use of machines, is obliged to appoint an ITP that is responsible for the safety of the work;
- workers should be appointed after checking in the organization where they work, knowledge, rules and instructions for the safe production of work with used machines;
- in the working area of the machine, safety signs must be installed in a prominent place, and warning signs on the car;
- to leave unattended car with the engine on is not allowed;
- during operating machines, steps must be taken to prevent their re-dumping or unauthorized movement under the influence of wind or in the presence of deviation of the area.

The provision of fire safety carried out in accordance with the requirements of DBN V.1.1-7-2017 "Fire protection. Fire safety of construction sites "and NAPB A.01.001-2004" Rules fire safety in Ukraine ".

Responsibility for fire safety at construction sites, the presence and maintenance of fire-extinguishing facilities, and the timely implementation of fire prevention measures provided by the project are (appointed by the order) chiefs of work in these areas.

Responsibility for the fire safety of domestic, auxiliary and auxiliary premises is carried by officials who are subordinated to the specified premises.

Temporary facilities, utility rooms, as well as construction sites should be provided with primary fire extinguishing means (fire extinguishers, sandboxes, bogies, shovels, buckets).
The distances between buildings, cars and places of open storage of building materials, structures must comply with sanitary and fire regulations. Passages and passages should be sufficiently wide for the fare, without the accumulation of foreign objects. The places of storage of materials that are easy to deal with must be provided with primary fire extinguishing agents.

For heating of inventory buildings, steam and water coolers should be used. The drying of clothes and shoes should be carried out in rooms specially adapted for this purpose, with central water heating or using water heaters. In temporary household and administrative facilities, where it is impossible to install central heating, it is allowed to have a furnace heating that meets the requirements of construction norms.

In case of detection of a fire (signs of burning), every person is obliged:

- To immediately notify fire department, at the same time it is necessary to indicate the address of the object, the place of the fire, the fire situation, the presence of people, as well as the name of his surname;
- take (if possible) measures for evacuation of people, extinguishing (localization) of fires and preservation of material values;
- in case of necessity to call other emergency services (medical, gas-saving, etc.).

Upon arrival on fire, fire units must be provided with unimpeded access to the territory of the facility.

Upon arrival of the fire department, the administration and technical staff at the facility are obliged to take part in the advising of the fire extinguisher on the structural and technological features of the facility where the fire occurred, to arrange for the involvement of the necessary measures related to the elimination of the fire and warning thereof development, forces and facilities of the object.

The head of the enterprise, together with the responsible persons, supervises the state of occupational protection and checks the working conditions of employees, observance of requirements of normative acts on occupational protection in divisions and services. The main types of control in an enterprise are current and selective control. Control over the state of occupational protection involves checking compliance of employees with safety requirements in the implementation of technological processes, rules of operation of machines, mechanisms, equipment, the use of collective and individual protection equipment. The enterprise also controls the state of occupational protection in certain structural subdivisions, workshops, services. This is why the company created:

- the Office of Occupational Safety of the Department of Security
- the Occupational Protection Service
- the Commission for Investigation of Accidents PrJSC “Kyivvodokanal”.

At the enterprise operates the Order No. 77 "On approval and putting into operation of the instructions on occupational safety" from 03.03.2017, there are instructing magazines for recruits and the instructing journals in the subdivisions. The frequency of instruction for
work with high danger is provided 1 time in 3 months, for general work - 1 time in 6 months.

In the performance of the work plan envisaged by the plan, occupational protection should be ensured at the expense of:

- organization of work processes, in accordance with the requirements of sanitary norms;
- mechanization and automation of complicated and hazardous works;
- availability of appropriate means of individual protection of employees (special overalls, shoes, protective helmets, etc.);
- availability of appropriate means of collective protection of employees (fencing, lighting, ventilation, protective and safety devices and appliances, etc.);
- provision of domestic facilities for recreation and restrooms;
- availability of appropriate means of collective protection of employees (fencing, lighting, ventilation, protective and safety devices and appliances, etc.);
- the organization of sanitary and medical services (especially the preliminary and periodic medical examination) in accordance with the requirements of the applicable standards and specifications of the work performed.

Responsibility for the definition and implementation of effective security measures shall be borne by the Contractor. The proposed measures must be included by the Contractor in the Construction Organization Plan and agreed with the customer. After the Customer's approval, the Construction Organization Plan must be included in the Work Program and, if necessary, updated. Particular requirements or occupational safety, if any, should be reflected in a separate section of the Plan. The approval by the customer of the Construction Safety Security Plan does not relieve the Contractor of responsibility for the safe execution of works, and this statement should not be interpreted as transferring responsibility, in whole or in part, to the Customer. All employees involved in the work must successfully complete training in occupational safety and health in accordance with the Law of Ukraine "On occupational safety and health". The training should include, in particular, complete information on occupational safety, fire safety and hygiene of employees involved in the performance of fire hazard operations. Additional special training must be obtained before work can begin (documentary evidence must be provided). In order to perform the work, the Contractor shall not employ employees who may be ill with a disease transmitted by water or being the carrier of the disease transmitted through the water. The Customer may require that the Contractor at his own expense send such a person to a medical examination to confirm his health by obtaining a health certificate. Responsible for compliance with occupational protection requirements appointed by the Contractor is charged with verifying compliance with safety rules in accordance with applicable law.

8.2. **Applicable requirements of EU/World Bank/other requirements and standards**

Currently, national regulatory documents on occupational safety and health are based on EU principles and approaches:

- the right to protection of the work of all employees and guarantees of its implementation;
- the employer's duties to ensure healthy and safe working conditions;
- implementation of state control over compliance with legislation on health and safety;
– preservation of the right of participation by trade unions and control over the observance of working conditions;
– accident insurance and occupational diseases.

EU legislation in the field of occupational safety is conditionally divided into two groups:
– EU directives on protection of employees;
– EU directives on the issue of goods to the market (including equipment, facilities, machinery, collective and personal protection equipment used by employees in the workplace).

The general principles of prevention and health protection are laid down in Council Directive 89/391/EEC.
– The requirements for occupational safety and health are set out in the following documents: Directive 89/654/EEC on a workplace; Directive 92/57/EEC on temporary or mobile construction sites;
– Directive 92/91/EEC on occupational safety at enterprises where minerals are mined through wells,
– Directive 1999/92/EC of the European Parliament and of the Council for the Protection of employees who are subject to potential hazards in explosive atmospheres);

Occupational safety requirements when using equipment:
– Directive 89/655/EEC on the use of labour tools by employees;
– Directive 89/656/EEC on the use of personal protective equipment in the workplace;
– Directive 90/269/EEC on the manual movement of goods, with risk of damage to the back of employees;
– Directive 90/270/EEC on working with display screens;
– Directive 92/58/EEC on the employment markings of a safety and/or health hazard at work);

Requirements for occupational protection in the work with chemical, physical and biological substances:
– Directive 90/394/EEC on the protection of employees from risks associated with exposure to carcinogenic substances at work;
– Directive 9824/EU on the protection of employees against the harmful effects of chemical substances in the workplace;
– Directive 96/82/ EU on the prevention of major accidents involving dangerous substances; Directive 2002/44/EU of the European Parliament and of the Council on the protection of employees from the risks related to vibration,
– Directive 83/477/EEC on the protection of employees from risks related to asbestos in the workplace;

Protection of the workplace of certain groups of employees:
– Directive 92/85/EEC on the protection at work of pregnant employees, those who just gave a birth and nursing mothers;
– Directive 94/33/EU on the protection of young people at work;

Regulation of working time
– Directive 93/104/EU concerning certain aspects of working time organization.

Requirements for equipment, machines, pressure vessels:
– Directive 87/404/EEC on simple pressure vessels;

A significant difference from the EU requirements is that the EU does not allow the existence of jobs with deviations from normal working conditions. In Ukraine and, in particular, ZPrJSC “Kyivvodokanal” pay the compensation and privileges are for hard working conditions. During the execution of construction work, the Contractor shall comply with the following standards and regulations:

– The Law of Ukraine "On labor protection";
– The Law of Ukraine "On health protection";
– NAPB.03.002-2007 "Norms for determining the categories of premises, buildings and external facilities for explosion and fire hazard";
– DBN A 3.2.2-2009 "Occupational safety standards system. Industrial safety in construction. Basic provisions";
– NPAOP 0.00-1.01-07 Rules for the installation and safe operation of load-lifting cranes;
– NPAOP 0.00-1.13-71 Rules for the arrangement and safe operation of stationary compressor units, air ducts and gas pipelines;
– NAPB A.01.001-2004 Fire safety rules in Ukraine;
– DSN 3.3.6.037-99 "Sanitary standards of industrial noise, ultrasound and infrasound";
– DSN 3.3.6.039-99 "State sanitary standards of industrial general and local vibration".
– SNiP Sh-4-80 "Safety in construction".
– "Rules for the installation of electrical facilities" (PUE)
– "Rules for the safe operation of consumer electrical facilities" (PBEEP);
– "Rules for the technical operation of consumer electrical facilities" (PTEEP). SNiP III-4-80 "Safety measures during construction";
– NPAOP 45.2-1.02-90 "Rules of occupational safety in the construction and repair of housing and communal services";
- INUV.3.2-218-051-95 "Instructions for ensuring traffic safety in road construction sites";
- GOST 12.1.005-88 General sanitary and hygienic requirements for the air of the working area;
- GOST 12.2.003-91 Security measures at construction sites.
9. Control and monitoring measures

In order to ensure the effective implementation of the proposed mitigation measures, including the realization of environmental protection obligations during the project implementation (construction stages and the stage of operation), a corresponding Monitoring Plan developed as a part of the ESMP. The format of the monitoring plan is shown in in the respective chapters.

The monitoring plan should have the following objectives:
- confirmation of proper implementation of mitigation measures;
- ensuring compliance with the requirements of the national legislative;
- ensuring that the stages of construction and operation within the framework of subprojects do not have an unforeseen impacts in future;
- ensuring that the construction and operation phases of project implementation do not entail future impacts on a larger scale than was anticipated;
- identification in the early stages of unforeseen pre-dangers and taking appropriate measures to eliminate them;
- monitoring the implementation of environmental restoration work after the completion of the construction phase.

The plan for monitoring social issues is aimed at achieving the following goals:
- building a positive relationship between the Kyivvodokanal Utility and the local communities;
- mitigation (or minimization) of negative social impacts caused by subprojects in accordance with the developed mitigation plan;
- Optimization of potential positive effects of subprojects.

Monitoring during construction / reconstruction
At the stage of construction (reconstruction), when replacing the equipment and carrying out a range of construction works, it is necessary to pay attention to preventing the potential negative effects described in the relevant part of the Plan.

Monitoring during operation
During operation it is recommended to conduct continuous monitoring of:
- prevention of soil and groundwater pollution by fuel and lubricants, noise, dust, accumulation of waste, ultraviolet radiation during welding, exhaust gas control during operation of vehicles, control of harmful wastes during reconstruction process, employee safety, leakage of water, quality of water supplied to consumers.;
- implementation in accordance with the established procedure of the permanent recording and control of the qualitative and quantitative composition of the pollutants determined by the design documentation for the emission sources;
- document turnover at the enterprise (submission of environmental statistical reports, payment, timely receipt of permits and declarations, extension of contracts for utilization/removal of waste).

The monitoring plan will be updated during the construction phase (if it needed).
Utility company, contractors and the project developer will conduct regular local monitoring during the project operation phase. The local authority responsible for environmental protection will also carry out regular inspections of water supply facilities at the construction and operation stage.

During the operation of the reconstructed water supply facilities, water quality control will be provided (periodically, according to the schedule of analytical control of the laboratory of the Utility), noise level (on demand), water leaks (constantly, servicing personnel of the Utility), as well as safety of service staff.
10. Development of the institutional capacity and training

The development of institutional capacity and training of the Kyivvodokanal Utility is carried out with the aim of strengthening and improving the tasks and functions of the Utility by introducing advanced tools and implementing modern technical solutions in the field of water supply and sanitation.

Thus, in order to ensure comprehensive protection of the natural environment, optimization of the social component, ensuring the compliance of the project activity with the requirements of national legislation and the World Bank requirements of, it is envisaged the inclusion and use of provisions on environmental protection, requirements of the protection of workers and local residents, as well as the issues of a mechanism of involuntary resettlement for the purposes of the project.

In turn, taking into account the possibility of a negative impact on the environment and the social sphere during the reconstruction process, a plan of mitigation measures and a monitoring plan are added to the ESMP. This will allow monitoring impact on the environment and locals and control the implementation of mitigation measures of negative impacts.

Among other general functions related to the implementation of the Project, in particular, the development of institutional capacity and trainings, the scope of the Customer's competence should include such measures as:

– Selection of the personnel, training and personnel training.
– Preparation and implementation of occupational professional hygiene and occupational safety measures in accordance with current standards and legislation of Ukraine.
– Development and implementation of a plan for internal control and quality management.
– Development and implementation of environmental monitoring programs in accordance with the current legislation.
– Develop and implement a public relations plan to exchange information with the public in order to conduct research and attract clients.

Contractors responsible for the procurement and installation of equipment are responsible for:

– ensuring the general fulfilment of its obligations to the Customer;
– fulfilment of obligations on implementation of environmental protection measures and population;
– reporting and other necessary documents regarding the management of social and environmental measures;
– ensuring the fulfilment of its obligations as part of social and environmental measures by subcontractors.

The plan envisages that state institutions (the State Service for Food Safety and Consumer Protection and the State Inspection for Environmental Protection, Fire Safety Service) will perform their monitoring functions within the limits of their competencies.
To monitor and effectively implement the project, a Regional Project Management Group was set up, which included key specialists of the Utility Kyivvodokanal.

In addition, the laboratory of the Utility will carry out constant monitoring of water quality for compliance with state standards both at the stage of execution of works and at the stage of operation.

In order to ensure the successful implementation of the Project, the Central Project Management Group (CPMU), which consists of key stakeholders, should be involved at all stages of the Project.
11. Environmental impacts of the proposed construction process

<table>
<thead>
<tr>
<th>No.</th>
<th>Water supply sector</th>
<th>Expected impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>West</td>
<td>Value of impact (H-large, A-average, L-low)</td>
</tr>
<tr>
<td></td>
<td>Reconstruction of the water pump station</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction stage</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Impact on the atmospheric air:</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td>- emissions of suspended particles undifferentiated in composition</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- emissions of carbon oxides</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- hydrocarbon emissions when laying asphalt pavement;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- NOx emissions during welding equipment operation;</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Pollution of groundwater and surface water</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td>- emergency spills of fuels and lubricants;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- contamination of surface water with solid construction and household waste.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- suspended in the air finely dispersed soil particles.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Impact on soil condition and terrain landscape</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td>- the risk of mechanical contamination due to improper handling of waste as a result of the formation of an additional volume of waste, construction waste with a total mass of 132.2 tons.</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
<td>Level</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>4.</td>
<td>Improper handling of waste</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Noise pollution</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Risk of emergencies</td>
<td>H</td>
</tr>
<tr>
<td>7.</td>
<td>Influence on the social sphere</td>
<td>H</td>
</tr>
<tr>
<td>8.</td>
<td>Observance of working conditions</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>
| **9. Health and safety of the population** | **H** | – Risk of increasing the number of work-related injuries;  
– Risk of incorrect conduct of safety briefings.  

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10. Operational stage</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **11. Influence on the state of atmospheric air:** | **H** | – emissions of suspended particles undifferentiated in composition  
– emissions of carbon oxides as a result of the work of motor vehicles  

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| **12. Pollution of groundwater and surface water** | **H** | – emergency spills of fuels and lubricants;  

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| **13. Influence on soil condition and terrain landscape** | **H** | – The risk of chemical contamination due to possible emergency spills of fuels and lubricants in the operation of construction equipment;  

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| **15. Risk of emergencies** | **H** | – Risk of emergencies  


12. Mitigation measures planned to be implemented

<table>
<thead>
<tr>
<th>Preliminary construction work phase</th>
<th>Installation</th>
<th>Operation</th>
<th>Installation</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Obtaining an authorization from Derzhbudkotrol for execution of works. Obtaining an authorization from the City Council’s Planning and Improvement Department for construction works.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Construction stage | | | | |
| Reconstructions of the water pump station: | | | | |
| – Reconstruction of 1st level pump stations of Dniprovskaya water station | | | | |
| – Reconstruction of 3rd level water pump station of Desnianskaya water station | | | | |

<table>
<thead>
<tr>
<th>Emissions of suspended particles undifferentiated in composition (dust) due to construction and installation works, transportation of loose materials, work of construction machinery and mechanisms,</th>
<th>Installation</th>
<th>Operation</th>
<th>Installation</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Organization of anti-dust measures: Development of an optimal scheme for the movement of construction equipment; Limitation of the speed of motor vehicles; Areas of temporary storage of dusty materials should be covered with special covering material or effective measures should be provided for dust suppression during operation; Loading, reloading and unloading of materials should be carried out with a minimum height difference and using wind shields; Dusting materials should be transported in a sealed package or using cover materials;</td>
<td>Minor</td>
<td>Minor</td>
<td>– Contractor organization responsible for the work;</td>
<td>Not expected</td>
</tr>
<tr>
<td>Combustion products of internal combustion engines: emissions of carbon oxides (carbon dioxide, carbon monoxide); other compounds in the composition of exhaust gases</td>
<td>- If possible, use equipment with electrical power; - If possible, minimize the use of diesel generators in construction.</td>
<td>Minor</td>
<td>Minor</td>
<td>-Contractor organization responsible for the work; - The project customer in cooperation with the structural subdivision of the local self-govern government body, whose competence includes these functions</td>
</tr>
<tr>
<td>Soil, Mechanical impact of vehicles</td>
<td>- if possible, prevent the movement of vehicles outside of paved roads or temporarily equipped access roads; - temporary placement of building materials and construction waste should be carried out in strict accordance with</td>
<td>Minor</td>
<td>Minor</td>
<td>-Contractor organization responsible for the work; - Project Customer</td>
</tr>
</tbody>
</table>
| **Mechanical pollution of soils** | Temporary storage of waste in specially designated areas in accordance with their hazard class.  
- to provide in the briefings questions of waste management.  
- prevent clogging of the territory and unauthorized disposal of waste, including construction waste  
- development and implementation of a treatment plan and waste | Minor | Minor | – Contractor organization responsible for the work; | Not expected |
| **Mechanical effect on vegetation** | Development of an optimal scheme for the movement of construction equipment in order to prevent the excessive influence of the formation of unregulated ways of movement of construction equipment, which will prevent the destruction of the grass cover;  
- if possible, prevent the movement of vehicles outside the paved roads or temporary access roads, thus preventing the destruction of the grass cover | Minor | Minor | – Contractor organization responsible for the work; | Not expected |
| **Noise pollution** | Conduct construction work in accordance with the schedule established by the current legislation of Ukraine or at hours agreed with the interested parties.  
- To reduce the noise levels, optimize the traffic flow associated with construction work, including the elimination of delivery at night | Minor | Minor | – Contractor organization responsible for the work;  
– Project Customer  
– Representatives of the structural subdivision of the local self-government body, whose competence includes these functions | Customer |
<table>
<thead>
<tr>
<th>Waste management</th>
<th>If necessary, install noise shields in the vicinity of construction equipment in order to prevent a negative impact on the local Life</th>
<th>Minor</th>
<th>Minor</th>
<th>Contractor organization responsible for the work;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste management</td>
<td>Develop and implement a detailed waste management plan covering all types of waste;</td>
<td>Minor</td>
<td>Minor</td>
<td>Contractor organization responsible for the work;</td>
</tr>
<tr>
<td></td>
<td>- The plan should be periodically updated and monitored for its implementation;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waste management</td>
<td>All works, as well as temporary placement of construction waste, must be carried out strictly in accordance with the design conditions and within the boundaries of construction sites with a clear application of places of temporary storage of waste with an exhaustive list of requirements to them in accordance with the type and class of waste;</td>
<td>Minor</td>
<td>Minor</td>
<td>Contractor organization responsible for the work;</td>
</tr>
<tr>
<td>Waste management</td>
<td>At the construction site, it is necessary to provide for the appointment of a person responsible for handling hazardous and solid domestic waste, monitor and instruct employees on all issues related to the range of his responsibilities.</td>
<td>Minor</td>
<td>Minor</td>
<td>Contractor organization responsible for the work;</td>
</tr>
<tr>
<td>Waste management</td>
<td>All works related to the transportation, utilization and storage of waste should be carried out with the availability of permits for this type of activity.</td>
<td>Minor</td>
<td>Minor</td>
<td>Contractor organization responsible for the work;</td>
</tr>
</tbody>
</table>
| | | | | Project Customer

Competent for compliance monitoring:
- Territorial subdivision of the State Ecological Inspectorate of Ukraine
- Territorial subdivision of sanitary-epidemiological service of Ukraine
The collection and temporary storage of waste is determined separately in accordance with the classes of their danger.

<table>
<thead>
<tr>
<th>Social risks</th>
<th>Risk of emergencies</th>
<th>The risk of complaints from local populations</th>
</tr>
</thead>
</table>
| - Contractor organization responsible for the work; – Project Customer Competent for compliance monitoring: – Territorial subdivision of the State Ecological Inspectorate of Ukraine – Territorial subdivision of sanitary-epidemiological service of Ukraine –
| - Develop and implement a comprehensive Emergency Response and Incident Recovery Plan; | Minor | Minor |
| - conducting briefings and training on safety | Minor | Minor |
| - all work must be carried out in strict accordance with the design conditions and within the construction sites | Minor | Minor |
| - installation of warning signs and tables, arrangement of necessary fences and transitional bridges, appropriate lighting at night time; | Minor | Minor |
| - Conducting explanatory work with the local population; | Minor | Minor |
| – Project Customer – Contractor organization responsible for the work; – Representatives of local self-government bodies. | Customer | Customer |
## Risk of injury to employees

- All works, as well as temporary placement of building materials and construction waste should be carried out in strict accordance with the design conditions and within the construction sites;

- Provide employees with personal protective equipment and overalls

- Conducting briefings and training on safety

---

### Reconstruction of the water pump station: Modernization of booster pump stations,

#### Construction stage

<table>
<thead>
<tr>
<th>Emissions of suspended particles undifferentiated in composition (dust) due to construction and installation works, transportation of loose materials, work of construction machinery and mechanisms,</th>
<th>Minor</th>
<th>Minor</th>
<th>–Contractor organization responsible for the work;</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Organization of anti-dust measures: Development of an optimal scheme for the movement of construction equipment; Limitation of the speed of motor vehicles; Areas of temporary storage of dusty materials should be covered with special covering material or effective measures should be provided for dust suppression during operation; Loading, reloading and unloading of materials should be carried out with a minimum height difference and using wind shields;</td>
<td>Minor</td>
<td>Minor</td>
<td>–Contractor organization responsible for the work;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Competent for compliance monitoring: –Territorial subdivision of the State Ecological Inspectorate of Ukraine –Territorial subdivision of sanitary-epidemiological service of Ukraine</td>
</tr>
</tbody>
</table>
- Dusting materials should be transported in a sealed package or using cover materials;

**Combustion products of internal combustion engines: emissions of carbon oxides (carbon dioxide, carbon monoxide); other compounds in the composition of exhaust gases**

- If possible, use equipment with electrical power;
- If possible, minimize the use of diesel generators in construction.

| Minor | Minor |

- Contractor organization responsible for the work;
- The project customer in cooperation with the structural subdivision of the local self-government body, whose competence includes these functions

**Soil. Mechanical impact of vehicles**

- If possible, prevent the movement of vehicles outside of paved roads or temporarily equipped access roads;

| Minor | Minor |

- Contractor organization responsible for the work;
- JSC Kyivvodocanal

**vehicle owner**
- temporary placement of building materials and construction waste should be carried out in strict accordance with the design conditions and within the construction sites

**Mechanical pollution of soils**
- Temporary storage of waste in specially designated areas in accordance with their hazard class.
- to provide in the briefings questions of waste management.
- prevent clogging of the territory and unauthorized disposal of waste, including construction waste
- development and implementation of a treatment plan and waste

<table>
<thead>
<tr>
<th>Impact</th>
<th>Level</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical pollution of soils</td>
<td>Minor</td>
<td>Minor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Representatives of the structural subdivision of the local self-government body, whose competence includes these functions

---

**Mechanical effect on vegetation**
- Development of an optimal scheme for the movement of construction equipment in order to prevent the excessive influence of the formation of unregulated ways of movement of construction equipment, which will prevent the destruction of the grass cover;
- if possible, prevent the movement of vehicles outside the paved roads or temporary access roads, thus preventing the destruction of the grass cover

<table>
<thead>
<tr>
<th>Impact</th>
<th>Level</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical effect on vegetation</td>
<td>Minor</td>
<td>Minor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Contractor organization responsible for the work;

---

**Noise pollution**
- Conduct construction work in accordance with the schedule established by the current legislation of Ukraine or at hours agreed with the interested parties.

<table>
<thead>
<tr>
<th>Impact</th>
<th>Level</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise pollution</td>
<td>Minor</td>
<td>Minor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Contractor organization responsible for the work;

---

JSC Kyivvodocanal
<table>
<thead>
<tr>
<th>Waste management</th>
<th>Minor</th>
<th>Minor</th>
<th>Contractor organization responsible for the work; JSC Kyivvodocanal</th>
</tr>
</thead>
<tbody>
<tr>
<td>To reduce the noise levels, optimize the traffic flow associated with construction work, including the elimination of delivery at night</td>
<td></td>
<td></td>
<td>- Contractor organization responsible for the work; JSC Kyivvodocanal</td>
</tr>
<tr>
<td>If necessary, install noise shields in the vicinity of construction equipment in order to prevent a negative impact on the local Life</td>
<td></td>
<td></td>
<td>- Contractor organization responsible for the work; JSC Kyivvodocanal</td>
</tr>
<tr>
<td>Waste management</td>
<td>Minor</td>
<td>Minor</td>
<td>Contractor organization responsible for the work; JSC Kyivvodocanal</td>
</tr>
<tr>
<td>Develop and implement a detailed waste management plan covering all types of waste; The plan should be periodically updated and monitored for its implementation;</td>
<td></td>
<td></td>
<td>- Contractor organization responsible for the work; JSC Kyivvodocanal</td>
</tr>
<tr>
<td>All works, as well as temporary placement of construction waste, must be carried out strictly in accordance with the design conditions and within the boundaries of construction sites with a clear application of places of temporary storage of waste with an exhaustive list of requirements to them in accordance with the type and class of waste;</td>
<td></td>
<td></td>
<td>- Contractor organization responsible for the work; JSC Kyivvodocanal</td>
</tr>
<tr>
<td>At the construction site, it is necessary to provide for the appointment of a person responsible for handling hazardous and solid domestic waste, monitor and instruct employees on all issues related to the range of his responsibilities.</td>
<td></td>
<td></td>
<td>- Contractor organization responsible for the work; JSC Kyivvodocanal</td>
</tr>
<tr>
<td>All works related to the transportation, utilization and storage of waste should be carried out with the availability of permits for this type of activity.</td>
<td></td>
<td></td>
<td>- Contractor organization responsible for the work; JSC Kyivvodocanal</td>
</tr>
</tbody>
</table>
# Social risks

## Risk of emergencies

- Develop and implement a comprehensive Emergency Response and Incident Recovery Plan;  
  Minor  Minor  – Contractor organization responsible for the work;  
  – JSC Kyivvodocanal

- Conducting briefings and training on safety  
  Minor  Minor  – Contractor organization responsible for the work;  
  – JSC Kyivvodocanal

- All work must be carried out in strict accordance with the design conditions and within the construction sites  
  Minor  Minor  – Contractor organization responsible for the work;  
  – JSC Kyivvodocanal

- Installation of warning signs and tables, arrangement of necessary fences and transitional bridges, appropriate lighting at night time;  
  Minor  Minor  – Contractor organization responsible for the work;  
  – JSC Kyivvodocanal

## The risk of complaints from local populations

- Conducting explanatory work with the local population;  
  Minor  Minor  – JSC Kyivvodocanal  
  – JSC Kyivvodocanal
## URBAN INFRASTRUCTURE PROJECT-2

<table>
<thead>
<tr>
<th>Risk of injury to employees</th>
<th>Contractor organization responsible for the work;</th>
<th>Representatives of local self-government bodies.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- All works, as well as temporary placement of building materials and construction waste should be carried out in strict accordance with the design conditions and within the construction sites;</td>
<td>Minor</td>
<td>Minor</td>
</tr>
<tr>
<td>- Installation of warning signs and tables, arrangement of necessary fences and transitional bridges, appropriate lighting at night time.</td>
<td>Minor</td>
<td>Minor</td>
</tr>
<tr>
<td><strong>Operational Phase</strong></td>
<td><strong>Reconstruction of the water pump station:</strong></td>
<td><strong>JSC Kyivvodocanal</strong></td>
</tr>
<tr>
<td></td>
<td>- Reconstruction of 1st level pump stations of Dniprovskaya water station</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Reconstruction of 3rd level water pump station of Desniashka water station</td>
<td></td>
</tr>
<tr>
<td><strong>Water leaks</strong></td>
<td>Proper control of the immediate elimination of leaks in accordance with the &quot;Rules of technical operation of water supply and sanitation systems of settlements of Ukraine&quot; (as amended in accordance with the order of the State</td>
<td>Minor</td>
</tr>
<tr>
<td><strong>Trouble-free operation of equipment</strong></td>
<td>Committee for Housing and Communal Services No. 2 dated January 4, 2005, by the Order of the Ministry of Housing and Communal Services farms №191 dated June 27, 2008). Water leaks during the execution of works within the limits of standards</td>
<td>Minor</td>
</tr>
<tr>
<td><strong>Modernization of booster pump stations</strong></td>
<td>- Preventive maintenance of equipment in accordance with technological requirements</td>
<td>Minor</td>
</tr>
<tr>
<td><strong>Water leaks</strong></td>
<td>- Proper control of the immediate elimination of leaks in accordance with the &quot;Rules of technical operation of water supply and sanitation systems of settlements of Ukraine&quot; (as amended in accordance with the order of the State Committee for Housing and Communal Services No. 2 dated January 4, 2005, by the Order of the Ministry of Housing and Communal Services farms №191 dated June 27, 2008). Water leaks during the execution of works within the limits of standards</td>
<td>Minor</td>
</tr>
<tr>
<td><strong>Trouble-free operation of equipment</strong></td>
<td>- Preventive maintenance of equipment in accordance with technological requirements</td>
<td>Minor</td>
</tr>
</tbody>
</table>
## 13. Monitoring plan

<table>
<thead>
<tr>
<th>Phase</th>
<th>Monitoring parameter</th>
<th>Place of monitoring</th>
<th>Method of monitoring/type of equipment</th>
<th>The monitoring period is continuous or periodic</th>
<th>Why is this parameter (optional) monitored?</th>
<th>Responsibility for:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td><strong>Residual water when replacing pump equipment</strong></td>
<td>On the construction site</td>
<td>Visually</td>
<td>During activity. If necessary</td>
<td>In order to prevent a negative impact on the state of the environment</td>
<td>Contractor responsible for carrying out works Competent for compliance control:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>– Territory subdivision of the State Ecological Inspectorate of Ukraine</td>
</tr>
<tr>
<td>Construction</td>
<td><strong>Quality of drinking water supply</strong></td>
<td>Project implementation area</td>
<td>Laboratory research</td>
<td>After completion of the reconstruction</td>
<td>In accordance with the current legislation, in particular, the State sanitary norms and rules &quot;Hygienic requirements for drinking water intended for human consumption&quot; (DSANPiN 2.2.4-171-10)</td>
<td>Contractor responsible for carrying out works Competent for compliance control:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>– Territory subdivision of sanitary-epidemiological service of Ukraine</td>
</tr>
<tr>
<td><strong>Volumes of waste generation</strong></td>
<td>Construction site</td>
<td>Visually accumulated</td>
<td>Constantly during activity</td>
<td>In accordance with the requirements of the current legislation of Ukraine and the European Union. Verification of waste management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-------------------</td>
<td>----------------------</td>
<td>-----------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rational Building Waste Handling</strong></td>
<td>Construction site</td>
<td>Visually accumulated</td>
<td>Constantly during activity</td>
<td>Contractor responsible for carrying out works Competent for compliance control: – Territorial subdivision of sanitary-epidemiological service of Ukraine</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Volumes of temporary storing of construction waste</strong></td>
<td>Visually</td>
<td>Constantly during activity</td>
<td>To prevent environmental pollution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Provision of appropriate working conditions for employees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>In order to provide a separate collection of waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Provision of appropriate working conditions for employees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>In order to ensure separate collection of waste according to the hazard class</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>prevention of environmental pollution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ensuring the proper working conditions for the employees and the comfort of moving the local population</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Customer Competent for compliance control: Territorial subdivision of sanitary-epidemiological service of Ukraine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>Fire and explosions</td>
<td>Constant monitoring by the contractor. By company representatives on an irregular (arbitrary) basis</td>
<td>In order to comply with the rules for the operation of equipment and ensure proper working conditions for the employees and the comfort of movement of the local population</td>
<td>Contractor organization responsible for the work;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>Ensuring appropriate working conditions and emergency response plans. Training</td>
<td>Constant monitoring by the contractor. By company representatives on an irregular (arbitrary) basis</td>
<td>In order to comply with the rules for the operation of equipment and ensure proper working conditions for the employees and the comfort of movement of the local population</td>
<td>Contractor organization responsible for the work;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>Compliance with standards and instructions.</td>
<td>Constant monitoring by the contractor. By company representatives on an irregular (arbitrary) basis</td>
<td>In order to comply with the rules for the operation of equipment and ensure proper working conditions for the employees and the comfort of movement of the local population</td>
<td>Contractor organization responsible for the work;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>Provision of personal protective equipment</td>
<td>Construction site</td>
<td>Monitoring</td>
<td>Constant monitoring by the contractor. By company representatives on an irregular (arbitrary) basis</td>
<td>In order to comply with the rules for the operation of equipment and ensure proper working conditions for the employees and the comfort of movement of the local population</td>
<td>Contractor organization responsible for the work;</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>Professional hygiene and occupational protection. Compliance with safety instructions, occupational protection procedures.</td>
<td>Construction site</td>
<td>Verification of data obtained as a result of fixation: Data on recorded accidents, Attached complaints and suggestions, data on the treatment of employees in the medical point of the enterprise, as well as in the medical institutions of the district</td>
<td>Constant monitoring by the contractor. By company representatives on an irregular (arbitrary) basis</td>
<td>In order to comply with the current legislation on occupational protection and ensuring adequate working conditions</td>
<td>Contractor organization responsible for the work;</td>
</tr>
<tr>
<td>Operation</td>
<td>Water leakage</td>
<td>PS</td>
<td>Visually Instrumental control</td>
<td>During operation; in cases of citizens filing complaints and</td>
<td>To prevent environmental pollution and ensure the effective functioning of</td>
<td>Contractor organization responsible for the work;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Customer</td>
<td></td>
</tr>
</tbody>
</table>
### Monitoring Activities Common for Reconstructions within the Sub-Project

- Reconstruction of 1st level pump stations of Dniprovska water station
- Reconstruction of IIIrd level water pump station of Desnianska water station

<table>
<thead>
<tr>
<th>Operation</th>
<th>Professional hygiene and occupational protection. Compliance with safety instructions, occupational protection procedures.</th>
<th>PS</th>
<th>Verification of data obtained as a result of fixation: Data on recorded accidents Received complaints and proposals</th>
<th>Constant monitoring by the contractor. By company representatives on an irregular (arbitrary) basis</th>
<th>In order to comply with the current legislation on occupational protection and ensuring adequate working conditions</th>
<th>Contractor organization responsible for the work;</th>
<th>Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation</td>
<td>Ensuring adequate working conditions. Emergency response plans. Training.</td>
<td>PS</td>
<td>Monitoring</td>
<td>Constant monitoring by the contractor. By company representatives on an irregular (arbitrary) basis</td>
<td>In order to comply with the rules for the operation of equipment and ensure proper working conditions for the employees and the comfort of movement of the local population</td>
<td>Contractor organization responsible for the work;</td>
<td>Customer</td>
</tr>
<tr>
<td>Operation</td>
<td>Fire and explosions</td>
<td>PS</td>
<td>Monitoring</td>
<td>Constant monitoring by the contractor. By company representatives on an irregular (arbitrary) basis</td>
<td>In order to comply with the rules for the operation of equipment and ensure proper working conditions for the employees and the comfort of movement of the local population</td>
<td>Contractor organization responsible for the work;</td>
<td>Customer</td>
</tr>
</tbody>
</table>
– Modernization of booster pump stations
## Annex 1. General information on the project and the site

<table>
<thead>
<tr>
<th>INFORMATION AND ADMINISTRATIVE DATA</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Ukraine</td>
</tr>
<tr>
<td>Project title</td>
<td>Urban Infrastructure Project - 2</td>
</tr>
<tr>
<td>Scope of project and works</td>
<td></td>
</tr>
<tr>
<td>Institutional structure (names and contacts)</td>
<td>WB (Project Team leader) Appointed by WB</td>
</tr>
<tr>
<td>Implementation structure (names and contacts)</td>
<td>Supervision over implementation of safety ensuring measuring</td>
</tr>
</tbody>
</table>

### SITE DESCRIPTION

<table>
<thead>
<tr>
<th>Site title</th>
<th>Industrial zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of site location</td>
<td>JSC Kyivvodocanal</td>
</tr>
</tbody>
</table>

Kyiv is the capital of Ukraine, one of the largest and oldest cities in Europe, located in the middle reaches of the Dnieper, in the northern Dnieper Ukraine. Political, socio-economic, transport and educational-scientific center of the country. A separate administrative-territorial unit in Ukraine and an administrative center of the Kyiv region. District center of Kyiv-Svyatoshinsky district. Administratively it is not part of the Kyiv region. The location of the central authorities of Ukraine, foreign missions, headquarters of most enterprises and public associations working in Ukraine.

The city of Kyiv is 847.66 thousand hectares. Height above sea level - 179 m. As of 01.02.2018 the official population of the city of Kyiv amounted to 2,934,401 people.

Object of the planned activity according to DSTU-N B V.1.1-27: 2010 "Construction climatology" is located in the I climate zone. The climate is temperate-continental with a short temperate-mild winter (average temperature in January is -5.9 °C) and warm, long summer (average July temperature is + 19.2 °C). The maximum monthly precipitation is 642 mm., the average rainfall is 359 mm, and the cold is 180 mm. Total evaporation from the surface of the earth is 540 mm. The stable snow cover is observed from 2 November to 9 February, the height of the snow cover varies from 5 to
70 cm (average - 30 cm). Number of days with snow cover 95 - 110. Depth of freezing of soil from 24 to 140 cm.

The object of construction is characterized by the following climatic conditions:
- depth of freezing of soil - 1.2 m;
- Typical snow load - 175.4 kgf/m²;
- Typical wind load - 41.8 kgf / m²;

The average annual air temperature is + 8 °C, the lowest in January (minus 4.7 °C), the highest in July (19.8 °C). The coldest day is the "minus" 40 °C, the hottest day is "plus" 40 °C. The duration of the heating period, at an average temperature of 0.1 °C, is 176 days.

Dominant winds: in the cold period, southern, south-eastern, in the warm period - south-west, west. Maximum possible wind speeds are 17 m/s annually, 20-21 m/s once every 5-10 years, 22-23 m/s once every 15-20 years.

Precipitation.

On average, 642 mm of precipitation fall over the year, less than in March and October, most of all in June and July. Every year a snow cover is formed, the highest height of which is observed in February. Relative humidity of air in the middle of the year is 74%, the smallest in May (67%), the highest in December (85%). The number of days with thunderstorms on average per year is 14, hail-3, snow-64.

<table>
<thead>
<tr>
<th>Disposition and distance to the sources of materials, especially filling materials, water and stone</th>
<th>The objects are located in the urban area with a developed system of engineering services</th>
</tr>
</thead>
</table>

**LEGISLATION**

Start of construction works requires:
- Declarations on start of construction works;
- Authorization from the city authority for start of works;
- Authorization for trenching, from the City Council’s Planning and Improvement Department;
- Contractor’s license for construction works;
- Contractor’s licenses for execution of increased-risk works.

**FORMATION OF INSTITUTIONAL POTENTIAL**

The development of institutional potential and training of the "Kyivvodokanal" Utility is carried out with the aim of strengthening and improving the tasks and functions of the Utility by introducing advanced tools and implementing modern technical solutions in the field of water supply and sanitation.
Thus, in order to ensure comprehensive protection of the natural environment, optimization of the social component, ensuring the compliance of the project activity with the requirements of national legislation and the requirements of World Bank, it is envisaged the inclusion and use of provisions on environmental protection, requirements of the protection of workers and local residents, as well as the issues of a mechanism of involuntary resettlement for the purposes of the project.

In turn, taking into account the possibility of a negative impact on the environment and the social sphere during the reconstruction process, a plan of mitigation measures and a monitoring plan are added to the ESMP. This will allow monitoring impact on the environment and locals and control the implementation of mitigation measures of negative impacts.

Among other general functions related to the implementation of the Project, in particular, the development of institutional capacity and trainings, the scope of the Customer's competence should include such measures as:

- Selection of the personnel, training and personnel training.
- Preparation and implementation of occupational professional hygiene and occupational safety measures in accordance with current standards and legislation of Ukraine.
- Development and implementation of a plan for internal control and quality management.
- Development and implementation of environmental monitoring programs in accordance with the current legislation.
- Develop and implement a public relations plan to exchange information with the public in order to conduct research and attract clients.